Southern Power & Industry

for Industrial and Power Executives of the South and Southwest

AUGUST, 1959

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PROVIDES information to solve design, installation, operating and plant management problems.

GAS TURBINE ..... MONROE, LOUISIANA

View through fuel gas compressor pipe yard looking toward gas turbine generator exhaust stock. Unit provided 10,000 kw of much needed capacity in less than one year. Efficiency will increase 10%.

SEE ..... PAGE 42

Complete Contents ....3 Advertisers Index 98

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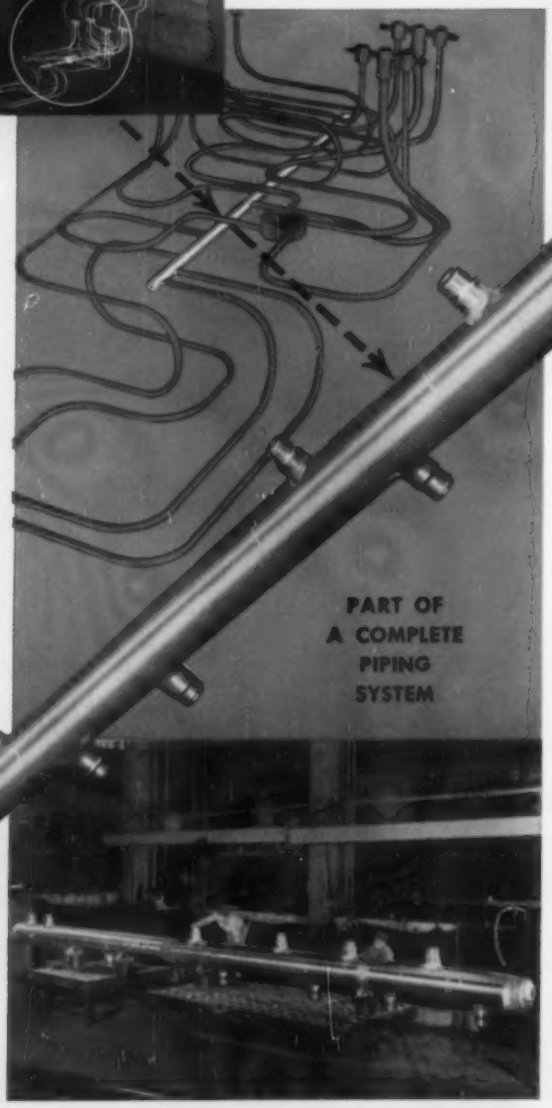

16,500 lb. Stainless Steel Main Steam Header

Stress analysis of a model of power piping is an established procedure at Pittsburgh Piping. It is used to predict accurately the physical reactions of high-temperature, high-pressure piping in service.

The photograph at top left shows a model of main steam piping which is part of a complete system shop fabricated and field erected by Pittsburgh Piping. The enlarged section of the model indicates the relative size and location of the main steam header. This header, shown in the main photo, is fabricated of Stainless Steel Type 316. It weighs 16,500 lbs. and its wall thickness is 3".

Model testing and shop fabrication are two phases of Pittsburgh Piping service which covers every aspect of a piping job—from blueprint through erection. We are specialists—thoroughly experienced in the theoretical and practical aspects, as well as in the code and insurance requirements of high-temperature, high-pressure piping.

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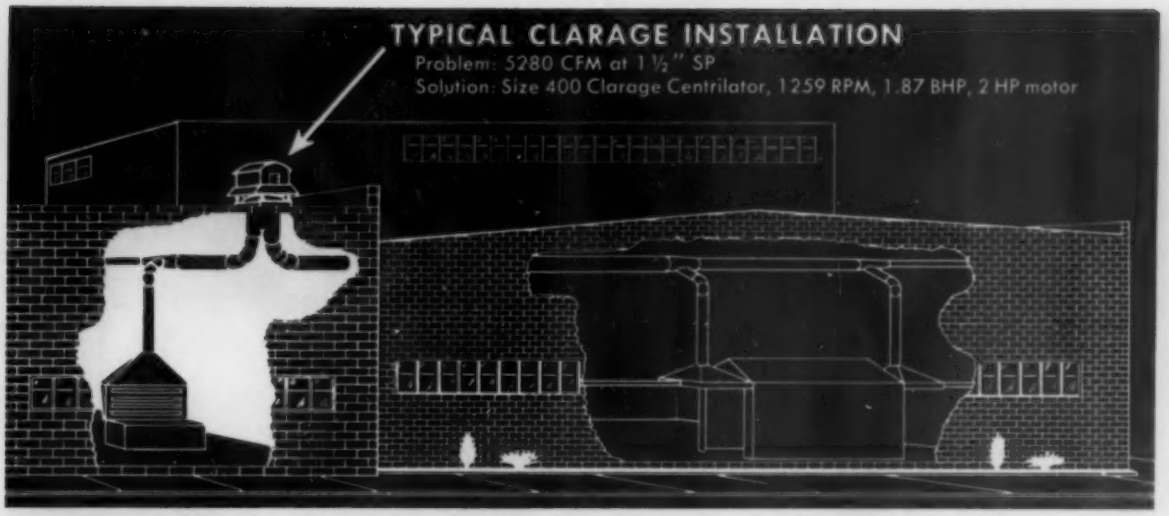
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Problem: 5280 CFM at 1 ½" SP
Solution: Size 400 Clarage Centrilator, 1259 RPM, 1.87 BHP, 2 HP motor

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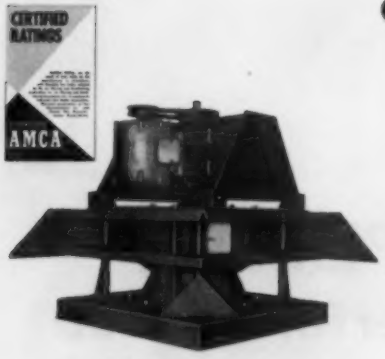
how to save space and money on your next air handling jobs



V-belt driven centrifugal type with backwardly inclined blade wheel. 10 sizes. Capacities from 1,500 to 26,500 CFM. (Shown above with weather enclosure and two sides of air apron removed.)

YOURS...ALL YOURS...with the Clarage Centrilator®* power roof ventilator. Handles static resistances to 2". Requires no floor space. Minimum installation cost. Unequalled accessibility. High efficiency for low operating cost. Ideal solution for numerous industrial systems such as the one shown above.

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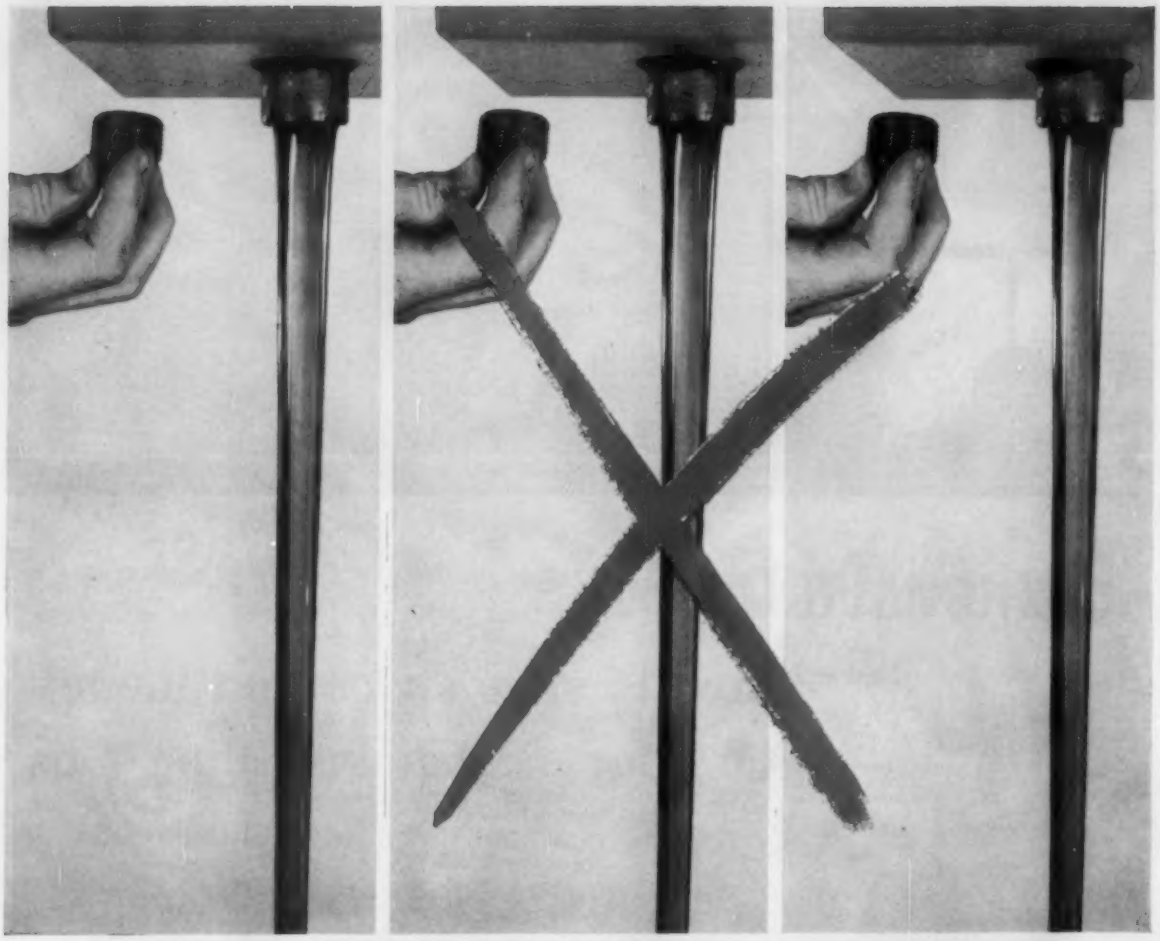

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Drain periods for a hydraulic system may be extended many times over by switching from straight mineral oils to a premium oil.

This has been proved time and again when the switch has been made to Texaco Regal Oil R&O without altering any other operating conditions.

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And there's a bonus! When you do drain, you'll find the system in cleaner condition. Save again on make-ready.

The advantages of switching to Regal Oil R&O are so convincing that Texaco has made a film about it. We'll be happy to arrange a showing at your plant without obligation. Call the nearest of the more than 2,300 Texaco Distributing Plants, or write to:

Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

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LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

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Southern Power & Industry

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Facts and Trends

August 1, 1959

◆ ALUMINIZED STEEL, manufactured by a new and exclusive process, is now being used in Wilco Refuse Burners.

The aluminized steel gives a longer life to the burner and resists rust and other forms of corrosion and erosion. The change to aluminized steel is a result of two years of tests confirming the value of the new process, which was developed by Armco. A pure metallic coating of aluminum to the burner lowers maintenance costs by obviating necessity for cleaning and painting.

◆ THERMOELECTRIC GENERATOR — Air Research & Development Command has revealed what is believed to be the most powerful thermoelectric generator ever built. The new generator developed by Westinghouse is at least ten times larger in electrical output than any similar device ever constructed in the United States.

About the size of a medicine ball and weighing 40 lb, the generator is not only the most powerful thermoelectric power plant ever devised but, pound for pound, is the most efficient and compact device of its type. It delivers three times as much power per pound of weight as any previously announced generator. It operates at a temperature of 850 F.

◆ METAL TENDERIZER, a new cutting compound formulated to help overcome surface tension, stress, and metal-to-metal adhesion which prevents tool rotation, has been announced by Crest Products, Inc. Among the many advantages claimed are better surface finishes, reduced tool wear and breakage, cleaner threads, and smoother cuts.

◆ GRASS WITHOUT SOIL — The Humphrey brothers near Red Springs, N. C. have proved grass can be grown without soil and done on a big scale to provide adequate green feed for a milking herd of 60 hungry Holsteins.

Electrically-controlled weather is the newest wrinkle that has helped keep the Humphrey dairy abreast with a competitive field. The grass incubator has turned out a crop of luscious green oats every six days — without using an ounce of soil. The oats are soaked, fertilized, spread, sprouted and brought to eight inches of verdant growth in a week's time. Two well-insulated metal buildings are equipped for automatic control of light, temperature and moisture day in and day out. Heat pumps use electricity and air to heat or cool the building as the outside temperature changes. Flourescent lights operate 24 hours a day.

◆ ELECTROSTATIC GENERATION, earliest known method of creating electricity (Otto von Guericke, 1660) may have a definite place in

LIFETIME SERVICE BACKS UP OCOTILLO'S NEW LJUNGSTROMS®

Extremely compact and highly efficient, these baskets of heat transfer surfaces are the heart of the Ljungstrom. (The photo below shows one being lifted into position.) Every inch of these baskets is the approximate equivalent of one foot of a standard tubular heat exchanger. The combined surface of the Ocotillo Air Preheaters provides 263,600 sq ft of heating surface.

The new Ocotillo Power Plant, near Tempe, Ariz., employs four Ljungstrom Air Preheaters for its two 835,000 lbs/hr boilers. Dependability is built into these Ljungstroms, from their corrosion-resistance to their double-life reversible elements (shown in the photo above).

But one of the most important reasons why Ocotillo chose Ljungstrom is Lifetime Air Preheater Service. Throughout the life of each unit (units dating from 1923 are still in operation), Air Preheater engineers make regular calls to inspect the units and keep them in top operating condition.

What's more, Air Preheater provides rapid factory service, too. Here's an example: a customer called on a Friday morning requesting immediate shipment of cold-end seals for an Air Preheater. But regular fabrication time would take until the weekend, when no ordinary transportation would be available.

So Air Preheater went to work. Special trucking was arranged. And by a tremendous effort, fabrication was completed *on the same day the order was received* . . . and the customer received the necessary parts *only ten hours after his initial request.*

Fast response to emergencies and regular inspection throughout the life of each Ljungstrom installation are two of the many advantages Air Preheater provides its customers. Another is expert knowledge of boiler and preheater problems—and how to lick them—gained from over 35 years' experience. Perhaps these reasons explain why nine out of ten preheaters sold today are Ljungstroms.

THE AIR PREHEATER CORPORATION

60 East 42nd Street, New York 17, N. Y.

Problem: PRODUCTION CHANGE REQUIRED IMMEDIATE DELIVERY OF SPECIAL ALUMINUM SHEETS

Solution:

RECENTLY, the Swartzbaugh Manufacturing Company of Murfreesboro, Tennessee made plans to produce an improved design of their Mealmobile. Swartzbaugh manufactures a variety of industrial carts for industry, institutions and branches of the Federal government. The Ideal Mealmobile which this company manufactures is a portable, heat-controlled, mechanically refrigerated food and drink unit. It has removable food trays constructed of lightweight, corrosion resistant aluminum. To make these trays Swartzbaugh needed special aluminum sheets.

MR. ROBERT WILLIS, purchasing agent of Swartzbaugh, shown pointing out the materials used to Mr. William Conklin, general sales manager, called our Nashville plant in an effort to line up the materials and delivery by production time the next morning. The special sheets needed are not normally stocked by aluminum warehouses but our Mr. A. C. Hammond, Nashville branch manager, turned to his wide range of types, gauges, widths and lengths of aluminum and came up with the sheets in stock, to fill the exact requirements of our customer.

MR. A. C. HAMMOND found, however, that making delivery for the following morning presented a problem. After getting the needed materials together he found that all of the Nashville branch trucks were on the road with scheduled deliveries that could not be interrupted. He quickly made arrangements with one of the local truck leasing companies to get a truck, with the result that the delivery of the urgently needed materials was accomplished the same afternoon the order was placed.

MR. JOHN D. SWARTZBAUGH, president of the company, has advised that the manufacturing schedule was maintained with no loss time incurred. This type of problem and an on-time solution is usual with our branch managers in their ten warehouses. With complete stocks of aluminum sheets, aluminum mill products, brass, copper and stainless on hand at all times such problems are solved quickly and satisfactorily. Call in your Reynolds Aluminum Supply Company representative—there are over 140 on the job at all times—and talk with him about your requirements. He may be able to contribute to your increased production and profits in 1959.

The Finest Products Made with Aluminum
Are made with REYNOLDS ALUMINUM

ALUMINUM MILL PRODUCTS
INDUSTRIAL BUILDING PRODUCTS
STEEL FLAT SHEETS
BRASS & COPPER
STAINLESS STEEL

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Established 1914

GENERAL OFFICES: ATLANTA, GEORGIA

SERVING WHEREVER YOU ARE IN THE SOUTH

Facts and Trends (Continued)

the Space Age, the AIEE engineers were told at their recent meeting.

Electrostatic generators are low power machines with poor power to weight ratios at atmospheric and gravity conditions existing on the surface of the earth. But under the weightlessness and vacuum of space, the picture changes and the generators may have power/mass ratios more favorable than electromagnetic equipment of equal output power. Rotating plate electrostatic machines possess several advantages over electromagnetic units. Since space consists of very high vacuum, this may be employed as the dielectric with the result that very little insulating material will be required.

◆ SAFETY AT CHEMSTRAND — Employees at the Chemstrand Corp. nylon plant at Pensacola, Fla. are continuing to make the plant one of the safest places in the world to work as they recently completed 10 million man-hours without a lost-time injury.

According to Fred G. Gronemeyer, vice president, if Chemstrand employees had followed the accident frequency rate of the textile industry as a whole, at least 49 persons would have been disabled and kept from their jobs. Chemstrand holds the world's record for safety in textile plants, and is an eight-time winner of the National Safety Council Award of Honor.

◆ MOLYBDENUM — Much previously classified material appears in print for the first time in "Fabrication of Molybdenum," a new book published by the American Society for Metals. Techniques covered in the new volume include forming, welding, protection and coating. Fabricating of molybdenum, a metal with great promise in aircraft, missile and other fields of metalworking, in particular is thoroughly covered. Price $6.50.

◆ HEAT RESISTANT RUBBER — United States Rubber Co. has licensed its major competitors and a group of other companies to vulcanize butyl rubber by a new process. Butyl rubber cured by the new process has high heat resistance and is especially suitable for products that are subjected to high temperatures for a long time.

One of its major uses is in tire curing bags. Bags made of this butyl last five times as long as the standard butyl bags. In addition to tire curing bags, U. S. Rubber is already using HTB (high temperature butyl), for steam hose, conveyor belts for moving hot materials, motor mountings, gaskets and belts for hot machinery and other products.

◆ LESS NOISE — A successful test project to slow up noise of sound travel through buildings with modern lightweight metal materials, landed a jet aircraft hangar construction contract of almost three-quarters of a million dollars for the Building Products Division of the R. C. Mahon Co.

The contract was awarded to Mahon by the Convair Division of General Dynamics Corp. It calls for the construction in Ft. Worth,Tex. of six giant 206 x 130 ft structures, all to be built by a combination of materials which were found by Mahon research engineers to reduce jet sound transmission by almost a third.

Write the editors for additional information on any of the above items. SOUTHERN POWER & INDUSTRY. 806 Peachtree St., N.E. Atlanta 8, Ga.

the SOUTH—SOUTHWEST

more power . . . more plants . . . more money

Universal Tractor-Equipment

A contract has been awarded to the M. E. Howard Construction Company, Richmond, Virginia, for the construction of the new offices and warehouse, consisting of 73,000 sq ft, for **Universal Tractor-Equipment Corporation,** Ford tractor and equipment distributor. The new offices and warehouse will be located at a site known as "Virginia Acres" on the Charles City Road near the Richmond Airport.

Construction has already begun, with completion and occupancy scheduled for October, 1959. A Product Training Center Building has recently been completed. These combined facilities will represent an investment of $600,000.

Dallas Ford Div. Expanding Facilities

Ford Division of **Ford Motor Company** is expanding its Dallas, Tex. assembly plant, according to Howard C. Sullivan, plant manager.

New construction includes a brick and steel addition equal to nearly one-third the size of the plant when it was built in 1925.

The modernization program also involves relocating rail facilities from the east side of the main buildings to the new addition, which will be designed mainly for production stock storage. Removal of rail facilities from the main building will allow additional assembly line space adjacent to present production lines. Cost of the project was not announced.

The assembly plant contained 252,000 sq ft of floor space when constructed in 1925, in 1940 an additional 84,000 sq ft were added, and in 1952, 284,000 sq ft were added.

Canco Plant for Atlanta

Construction is under way on **American Can Company's** new Atlanta, Ga. can-making plant, and completion is expected by November 1.

The multi-million-dollar plant will be a one-story building containing approximately 150,000 sq ft of floor area. It is being constructed on a 15-acre site.

The new plant's high-speed automatic equipment will give it an annual rated capacity of nearly 400 million metal cans for food, beer and soft drinks, and composite metal-paper containers for other products. It will employ up to 250 people when in full operation.

The container firm said the new plant will serve the growing Georgia industries packing food, beverages and other products, as well as customers in parts of Alabama and South Carolina.

Kingston Mills Expands

To be completed late this year is an 80,000 sq ft plant expansion for **Kingston Mills, Inc.** at White, Ga.

The building will house the yarn-spinning and carpet-making machinery of the company.

Baltimore Spice — Md.

Ground has been broken for **The Baltimore Spice Company's** new plant at Garrison, Maryland about 3 miles northwest of Baltimore. The company's general offices, plant, laboratories and warehouse will be housed in the building which will contain in excess of 45,000 sq ft of floor space. Sufficient land has been acquired to enable the size of the plant to be tripled as the need for expansion developes.

According to Ralph A. Brunn, Baltimore Spice executive vice president, the company expects to occupy its new facilities in December.

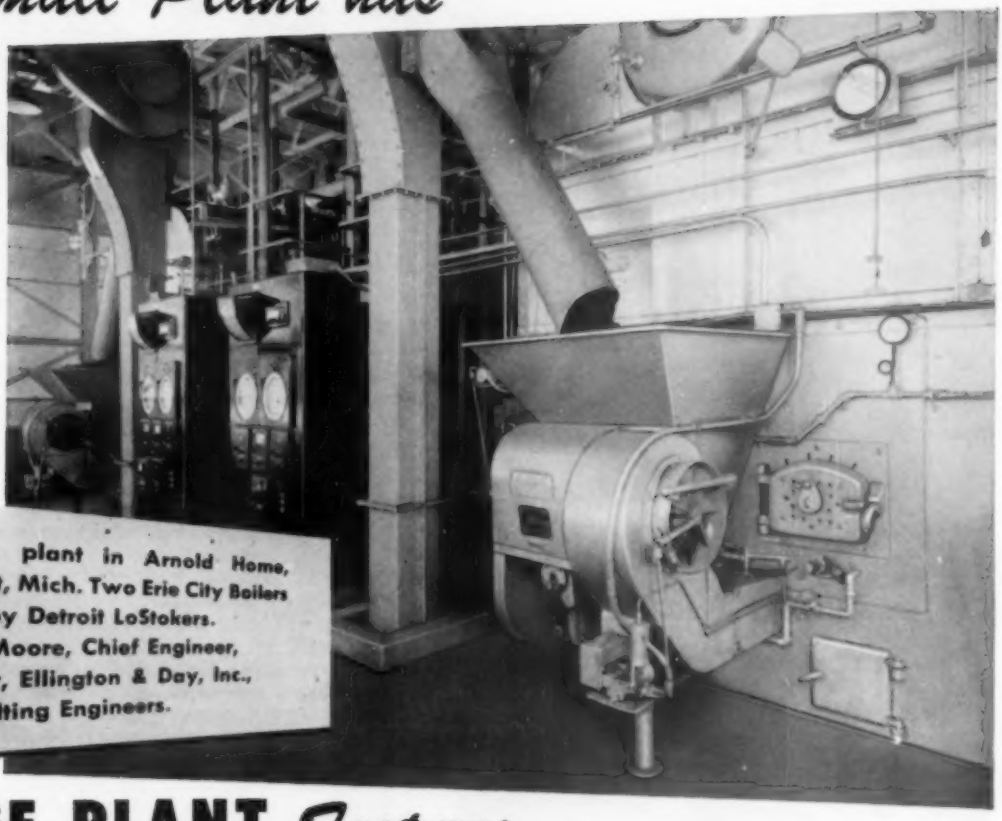
The Baltimore Spice Company imports, grinds and manufactures a variety of spices and seasonings for meat packers, food processors, canners, bakers and pickle packers. It also produces a line of consumer products under the brand name of Old Bay consisting of seafood seasoning, also tenderizers and hickory charcoal seasoning for meats.

Murray Mfg. Expands Kentucky Operations

Scheduled for completion in June, 1960 is the $2,500,000 expansion program for the **Murray Mfg. Co.** It is part of a $3,700,000 program of the Tappan Co. of Mansfield, Ohio.

The expansion of the Murray, Kentucky stove plant will add 400 employees and will double its present production capacity.

Small Plant has



Steam plant in Arnold Home, Detroit, Mich. Two Erie City Boilers fired by Detroit LoStokers. C. E. Moore, Chief Engineer, Harley, Ellington & Day, Inc., Consulting Engineers.

LARGE PLANT *Features . . .*

ONE DETROIT LoStoker DOES WORK DESIGNED FOR TWO

When the Arnold Home in Detroit was enlarged from 285 to 401 beds, a complete new steam plant was built. Two water tube boilers each of 9,000 pounds of steam per hour capacity were equipped with Detroit LoStokers. This was to furnish steam for a large laundry, the kitchens, water heating and all of the space heating.

It was expected that both boilers would be needed to carry the load in colder weather, especially after two more buildings with a total of 63 additional beds were added. However only one boiler was needed throughout one of the coldest winters on record in Detroit. One boiler was always on standby, ready for emergencies, extremely important in a home sheltering old and chronically ill people.

Either of the Detroit LoStokers easily met the firing requirements, including the rapid load fluctuations that occur when the laundry is in operation.

Stokers and boilers have full automatic control and complete instrumentation. Stoker hoppers are filled with coal by bucket elevators. Ash is dropped into a pit below the firing floor for periodic removal.

The Detroit LoStoker is a complete mechanical firing unit—ram type underfeed. It is efficient, dependable and built for long life. Requiring little power for operation it may be driven either by electric motor or steam turbine, under automatic control. Capacity range is 3,000 to 12,000 pounds of steam per hour. It is one of a complete line of Detroit stokers for boiler capacities up to 400,000 pounds of steam per hour.

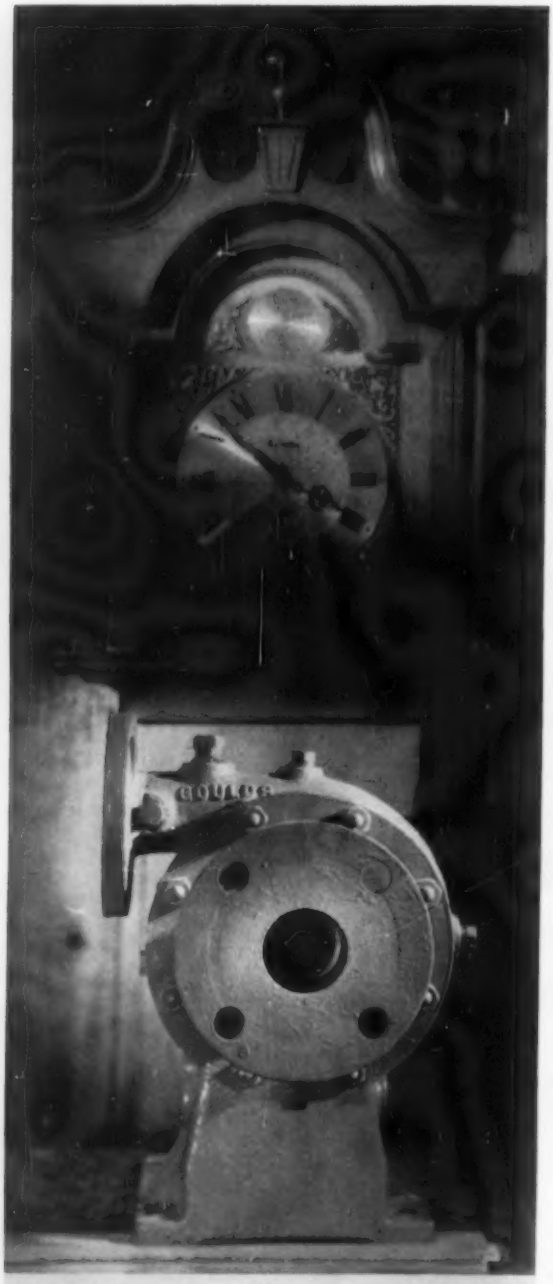
Detroit Stokers save you money—ask us for details.

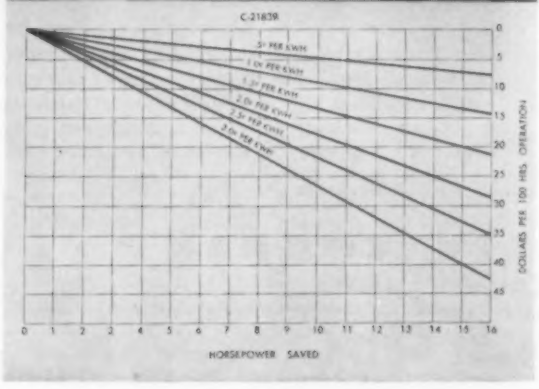
DETROIT STOKER COMPANY

MAIN OFFICE AND WORKS—MONROE, MICHIGAN

DISTRICT OFFICES OR REPRESENTATIVES IN PRINCIPAL CITIES

THE MODERN FIRING METHOD IS COAL, WITH DETROIT STOKERS





How do you know when you need a new pump?

"One way is to calculate power saving," writes Phil Olmstead, *Chief Engineer*, Goulds Pumps, Inc.

If your *needs* have changed since you installed your present pump, or . . .

If *efficiency points* have changed due to deposits building up in your piping, or . . .

If your present pump is *frequently under repair*, then . . . it's about time you began thinking about getting a new pump!

That's a pretty good rule of thumb to go by when the time comes to consider replacing an old pump with a new, efficient unit. But you don't have to rely merely on rules of thumb—you can actually *calculate* the power saving a new pump will bring you. Let me illustrate:

Only recently I discussed and demonstrated power saving with an engineer friend of mine. He had a pump that he had purchased five years ago. At that time its efficiency was high . . . but changing conditions led to reduced efficiency. According to the pump curve, its efficiency had dropped to 73 per cent: *600 gallons per minute @ 240 total dynamic head (pressure)*.

To prove a point, we went through the Goulds catalog and found a pump with the same rating but which was 82% efficient.

Next we merely applied the following formula to determine the brake horsepower:

$$BHP = \frac{\text{Gallons per Min.} \times \text{Total Head in feet}}{3960^* \times \text{Pump efficiency expressed as a decimal}}$$

*Horsepower conversion figure (foot-pounds to gallons per minute)

This is what we got:

$$\text{OLD PUMP: } \frac{600 \times 240}{3960 \times .73} = 49.8$$

$$\text{NEW PUMP: } \frac{600 \times 240}{3960 \times .82} = 44.3$$

HP SAVED: 5.5

Now check the savings chart illustrated on this page. Follow the "HP saved" line to the electric current rate line—in this case, 2¢ per KWH. The savings per 100 hours of operation would be approximately $10. At, say, 10 hours a day, 300 days per year, my friend saw that he would be saving around $300 with a new pump.

Try it for *your* pump. Calculate how much you would save with a new Goulds pump replacing your old one. Then call in a Goulds application engineer to talk it over and determine the *right* one for your needs. Or drop a line to me, Phil Olmstead, at Goulds Pumps, Inc., c/o Dept. SPI-89, Seneca Falls, New York, and I'll see that you get the information you need.

GOULDS PUMPS

Specify POWELL PRESSURE SEAL GATE VALVES

In all sizes—600, 900, 1500, 2500 Pounds and Higher. Globe, Angle and Check valves also available.

Pressure Seal Gate Valves, made the superior Powell way, offer many advantages—including:

* Streamline flow passage—making possible maximum flow with minimum turbulence.
* Outstanding simplicity of design, smooth body contour and weight reduction—assuring easier installation, greatly reduced insulating costs, and a marked saving in space.

For all your flow control requirements—water, oil, gas, air, steam, and corrosive fluids—Powell has the right valve in the right size and the right metal. Consult your local Powell distributor or write directly to us.

THE WM. POWELL COMPANY
Dependable Valves since 1846
Cincinnati 22, Ohio

POWELL...world's largest family of valves

News of the South-Southwest — more power . . . more plants . . . more money

Borden Expansion in Oklahoma City

Underway for **Borden Co.** is $150,000 expansion and modernization program with completion expected by mid-summer.

A 50 x 50 ft. addition is included in the project, along with the complete renovation of existing facilities.

Research Lab for Chemstrand — N. C.

The Chemstrand Corporation will build a multi-million dollar research laboratory in the Research Triangle Park of North Carolina.

Initial research operation is scheduled to begin in late 1960. By 1963 over 400 persons are expected to be employed.

The Research Triangle Park is an area located in the center of a triangle formed by Duke University in Durham, the University of North Carolina in Chapel Hill, and North Carolina State College in Raleigh.

Chemstrand, one of the world's largest producers of chemical fibers, manufactures Acrilan acrylic fiber at Decatur and Chemstrand nylon at Pensacola, Fla. The research facilities presently are located at Decatur.

Forest Kraft — Ga. New Company & Plant

Inland Container Corporation of Indianapolis, Indiana, and **The Mead Corporation** of Dayton, Ohio, have jointly established the **Forest Kraft Company** for the purpose of financing an expansion program in the mill of the Rome Kraft Company at Rome, Georgia to meet the anticipated requirements of containerboard for the two parent companies.

A new paper machine, 254 inches wide, with a daily capacity of 500 tons of containerboard, together with pulp production facilities and additional power services to support the new operation, will be installed.

Contracts have been arranged with the Rust Engineering Company for the design and construction of the new plant, which is expected to be ready for operation during the second half of 1961. The paper machine has been placed on order with the Beloit Iron Works.

The Forest Kraft Company, like the Georgia Kraft Company and the Rome Kraft Company, will be owned 50% by Mead and 50% by Inland, and the output will be divided equally by the two parent companies.

The Inland Container Corporation is one of the leading manufacturers of high quality shipping containers, with national distribution. Mead's minority interest in Inland is of long standing, dating back to the early 30's, when Inland's business was solely converting. Mead in recent years has entered the converting field and now is likewise a major manufacturer of shipping containers. This action, it is felt, will prove to be to the best interests of both corporations in the future.

The President of the Georgia Kraft Company, since its organization in 1946, has been Al H. Mahrt. He presently is a Director and was formerly Executive Vice President for Finance of The Mead Corporation. P. F. Holton is a Director and Vice President of the Inland Container Corporation and also Vice President of the Georgia Kraft Company. Herbert A. Kidd, of Rome, Georgia, is Vice President and General Manager of the Georgia Kraft Company. All three of these individuals hold identical offices in the Rome Kraft Company, and will also hold such offices in the Forest Kraft Company.

Pittsburgh Plate Expansion — Houston

Pittsburgh Plate Glass Company has announced an extensive expansion program which includes a new office and laboratory structure for its Houston, Texas, paint factory. The ultra-modern building which will become an extension of the present office structure, will be used for executive, purchasing, sales and laboratory offices, and the former office area is being converted to accommodate the Accounting Department, a larger cafeteria, and other functions.

Construction is already under way on the new building which will contain 10,000 square feet of floor space and feature a modern glass curtain wall on the front elevation. Target date for completion of the structure is September 1. Equipment to manufacture Pittsburgh Plate's Selectron Resin, a company-developed polyester-resin, also is being installed at the Houston factory, and this new equipment is expected to be on stream this month. Much of the Selectron production will be used by manufacturers of fiberglass boats, one of the faster growing industries in the Southwest.

Spinning Plant — N. C.

Getting under construction on a 20 acre site in Brunswick, N. C. is a new spinning plant for **National Spinning Co.** of New York.

The 75,000 sq ft building will be constructed by Daniels Construction Co. of Greensville, S. C. Upon its completion it will manufacture knitting yarn, wool and synthetic, for the knitted outerwear industry.

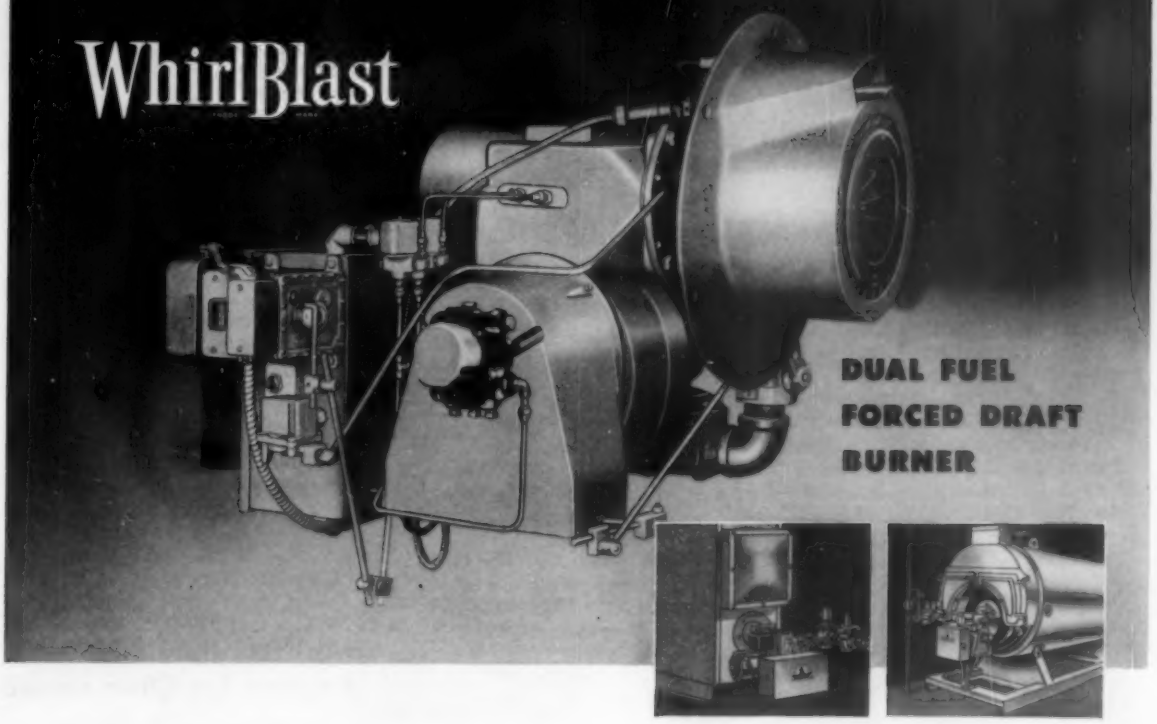
Victor Metal Products — Va.

Underway for **Victor Metal Products Corp.** of Greenwich, Conn. is a 25,000 sq ft plant for the manufacture of aluminum tubes and cans in Harrisonburg, Virginia.

Completion of the $500,000 project is scheduled for September.

A new development by Iron Fireman

WhirlBlast



Makes firebox boilers super-efficient

NO SMOKE

Burns clean in less than 10 seconds. The WhirlBlast flame is brilliantly clean almost instantly, and stays clean. Although accepted standards of oil firing allow a 15 minute warm-up period, during which time smoke is tolerated, the Iron Fireman WhirlBlast burner is clean in seconds. Smoke and soot are unburned fuel—completely wasted by smoky starts.

NO STACK

Needs only an exhaust vent. Boilers with conventional burners require from 30 to 80 feet of stack or an induced draft fan. Sealed steel firebox boilers with WhirlBlast burners require only a small exhaust vent.

CONSERVES BOILER HEAT

Standby loss is almost nil. The highly efficient WhirlBlast burner does not need a refractory combustion chamber to "support combustion." Consequently there is no brickwork to store heat to be wasted during "off" periods. Standby heat loss is reduced to an insignificant minimum.

CUTS COSTS

Low fuel bills; low maintenance. Efficient combustion and low standby loss conserve fuel. Elimination of smoke and soot means no fouled boiler tubes, no carboned nozzles or electrodes; no refractory maintenance expense.

A COMPLETE PACKAGE

No special skill to install, adjust, service or operate. The WhirlBlast burner (for gas, oil or dual-fuel combination) comes from the factory fully wired and tested. Bolts to boiler front with firing head through fire door. No special combustion chamber or firing pit needed. Exceptional installation saving.

Send coupon for further information.

IRON FIREMAN®
AUTOMATIC FIRING EQUIPMENT
FOR HEATING, POWER, PROCESSING

IRON FIREMAN MANUFACTURING COMPANY
3138 W. 106th Street, Cleveland 11, Ohio
(In Canada, 80 Ward Street, Toronto, Ontario)

Please send me more information and specifications on the Iron Fireman WhirlBlast burner.

Name _____
Firm _____
Address _____
City _____ Zone ____ State _____

Carlon Expansion — Florida

Carlon Products Corporation, Aurora, Ohio, has announced the purchase of new plant facilities in High Springs, Florida. According to William L. Abramowitz, president of Carlon, the 100,000 sq ft plant will be the biggest plastic pipe plant under one roof in the world.

The plant will manufacture Carlon's complete line of plastic pipe, including conduit, "D" sewer and drain, polyvinyl chloride, Hi-Mol, polyethylene, and HTHT Kralastic. A complete stock of plastic fittings will also be maintained at the new facility. The plant will be under the supervision of **John Rudge,** Vice President of Carlon. **William Simko** will be plant manager.

It is a part of Carlon's expansion program which, in the past six months, has included completion of one million dollar facilities at the firm's Aurora, Ohio plant; completion of a new extrusion plant in Compton, California; and purchase of production facilities in Lubbock, Texas. The company, an affiliate of American Research and Development Corporation, operates ten plants throughout the country.

American Can Opens Facility in Ala.

American Can Company has formally opened its multi-million-dollar pulp and paper mill in Naheola, Alabama.

The mill is operated by Marathon Southern Corporation, a Canco subsidiary and an operating unit of the company's Marathon Division.

Operations at Naheola include a pulp mill, a pulp bleach plant, pulp drying facilities and two paper machines. A third paper machine is being installed.

Production at the mill includes household tissues and napkins, specialty papers, toweling and lightweight paperboard. With the completion of the additional equipment, the mill also will produce a wide range of paperboard for food packaging materials and similar products.

Containing nearly 500,000 sq ft of floor area, the mill occupies 80 acres in a 1,100-acre tract. The operation provides a market for 200,000 cords of pulpwood a year.

John E. Spalding is plant manager.

$100,000 Expansion for Roxbury Carpet Co.

Plans are underway for a $100,000 program of modernization and installation of new equipment for Roxbury Carpet Co.'s subsidiary, **Roxbury Southern Mills, Inc.**

The expansion will strengthen the company's output of tufted floor coverings.

Bowaters Erecting Mills in S. C.

The Catawba, S. C. mill of **Bowater Carolina Corp.** with a capacity of some 400 tons of sulphate unbleached and semi-bleached pulp per day is scheduled for completion the latter part of 1959.

The initial cost will be approximately $38,000,000 which represents a cost of over $100,000 investment for every job created.

The mill site covers 1,200 acres; 182 of these acres have been prepared to provide a holding lagoon which will hold the mill effluent until it can be redeposited into the Catawba River without danger of stream pollution.

Pulp will be produced from several species of Southern Pine. Initial mill requirements will be 800 cords per day. It is estimated that approximately $4,000,000 will be sent annually for wood.

Employment will be provided for approximately 350 persons initially. Annual payroll will be about $3,000,000.

Also under construction, to be completed the first part of 1960, is a hardboard plant.

Costing $7,000,000, this plant is designed to produce 500,000 square feet of hardboard daily. The payroll will be some $500,000 annually with 125 employed originally.

Employing a new process, the plant will use only hardwood pulpwood — oak, gum and poplar. Wood consumption is expected to exceed 1,000 cords weekly.

Multi-Million Dollar Facility for Chemstrand

The Chemstrand Corporation, one of the nation's leading producers of chemical textile fibers, plans to construct a multi-million dollar nylon yarn plant on a 1,400 acre tract at Greenwood, S. C.

The new plant will provide for major expansion of Chemstrand nylon production. In the first stage, capacity for an additional 10-million pounds of nylon yarn will be available in late 1960.

Chemstrand has recently announced plans to construct a nylon development center at Pensacola, Fla. and a multi-million dollar research center in the North Carolina Research Triangle Park near Raleigh, Durham and Chapel Hill, N. C.

Push-Button Mill—Tex.

Underway for **Armo Mills, Inc.** is a $250,000 push-button feed mill with a capacity of 100 tons per eight hour shift.

The plant is being constructed on the site of the present feed mill.

Design and layout of the plant is by the Engineering Division of Hayes & Stolz Industrial Mfg. Co. of Ft. Worth.

QUALITY

RELIABILITY

ABUNDANCE

RAPID SERVICE

TECHNICAL ASSISTANCE

VARIETY OF GRADES AND STRENGTHS

A BASIC PRODUCER TC TENNESSEE CORPORATION FROM MINE TO FINISHED PRODUCT

SULFURIC ACID

TENNESSEE CORPORATION, The Southeast's Leading Sulfuric Acid Supplier

Whether your Sulfuric Acid requirements are an occasional tank car or large tonnages, check with Tennessee before making your decision. You will find our acid attractively priced, high in quality, consistently available and backed by outstanding customer service gained through years of growth and experience.

Our complete control of raw materials from mine to finished product allows our total independence from elemental sulfur and enables Tennessee Corporation to accommodate and ship large tonnages of acid quickly and with minimum notice.

The sulfur contained in the ore we process yields Virgin Sulfuric Acid of highest quality free from organic matter, very low in iron, and in no way contaminated from regenerated or spent sulfuric acid sources.

TENNESSEE COPPER CO., DIVISION TENNESSEE CORPORATION, COPPERHILL, TENNESSEE, produces all commercial grades and strengths of Sulfuric Acid from 60° Baume through the various Oleums.

We would welcome the opportunity to tell you our story. Call JAckson 3-5024 Atlanta, Georgia, or write—

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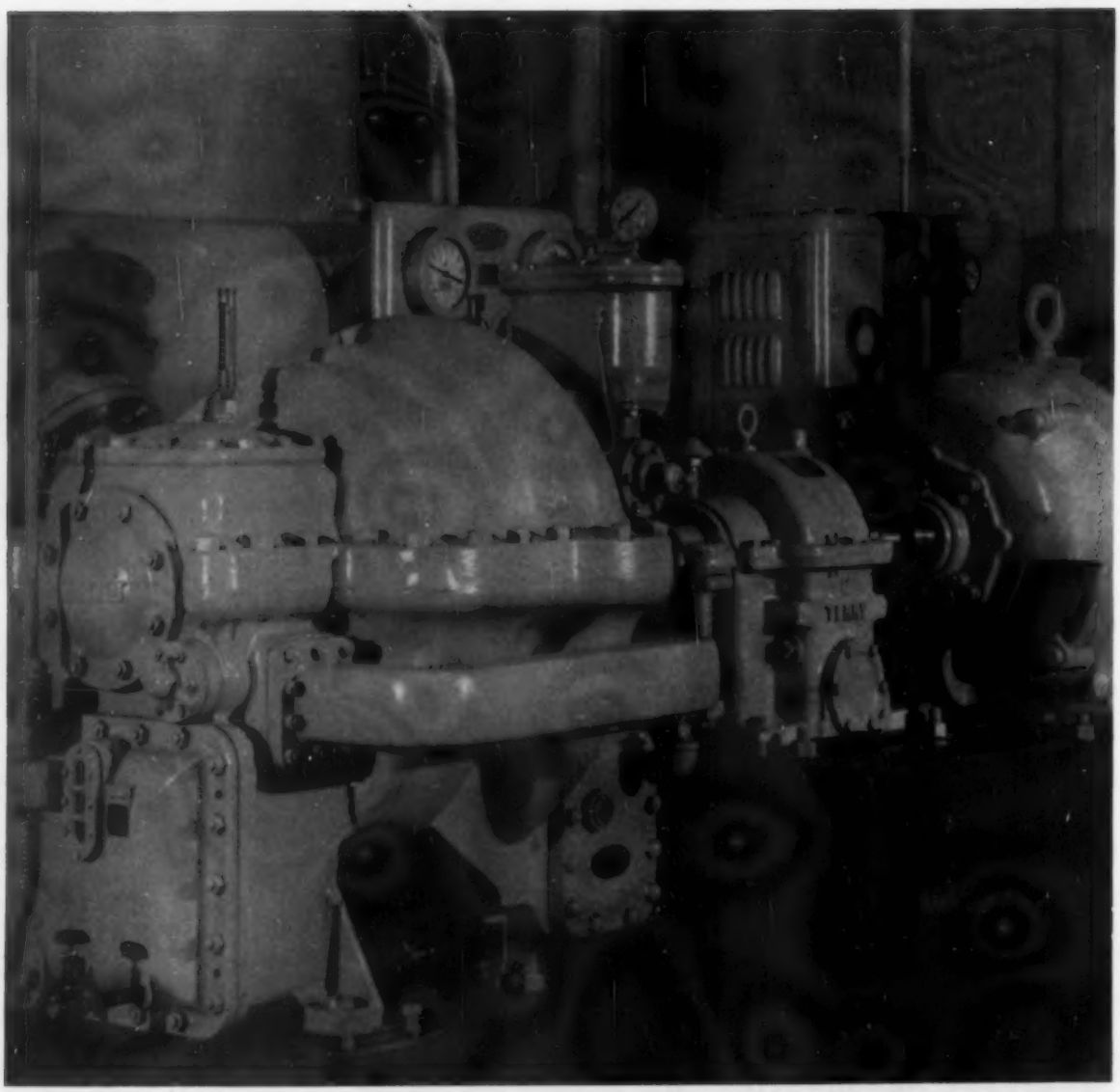
TENNESSEE CORPORATION

617-629 Grant Building, Atlanta 3, Georgia



It started over 70 years ago

The unit shown only started Monday morning as usual . . . but the Standard Oil lubricants that keep it rolling trouble-free, day-in and day-out, had their start in southern industry *72 years ago*. During these years changes in power producing machinery have been constantly reflected in new and improved Standard Oil lubricants. The success of Standard Oil lubricants in keeping pace with the growing needs of industry is attested by the continuing *first place popularity* of Standard Oil lubricants throughout southern industry.

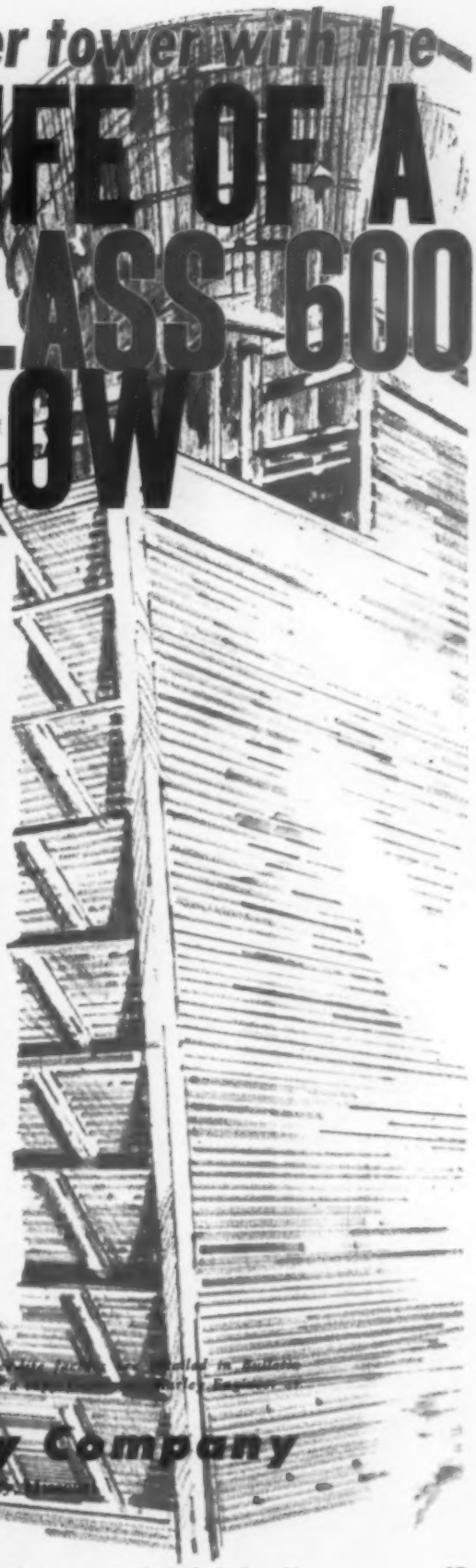
Aside from unmatched results in product development and performance Standard Oil's 72 years of experience offer another very practical benefit . . . available to you at any time and at no charge. Through your Standard Oil lubrication specialist Standard Oil's full experience is at your command whenever lubrication poses a problem in your operation. Why not call him in today?

STANDARD OIL LUBRICANTS

STANDARD OIL COMPANY
(KENTUCKY)

You can't buy any other tower with the

SERVICE LIFE OF A MARLEY CLASS 600 DOUBLE-FLOW



Years . . . many more years than those now considered usual service life of cooling towers . . . are engineered into every Marley Class 600 Cross-Flow. Years of full performance; years of low maintenance; years for longer amortization. By incorporating (after comprehensive research) modern inert materials and protective processes throughout Class 600 design, Marley engineers have achieved an over-all durability that prolongs tower life expectancy beyond any current norm.

GLASS FIBER REINFORCED POLYESTER—steel-strong and impervious to corrosion—makes many components invulnerable to corrosion and decay; GRP molded **Fan Blades** are shatter-proof, shock resistant and completely unaffected by moisture or corrosive atmosphere. **GRP Fill Support Grids** position fill bars perfectly and permanently—no nails needed. **GRP Timber Connectors, GRP Retaining Rings** and **GRP Fan Cylinder Positioning** cannot corrode nor are they subject to oxidation that encourages decay in contacted lumber . . . they add vitality to critical areas, as do **Ceramic Timber Ring Connectors** and **Louver Supports** molded of rigid linear polyethylene.

ASBESTOS CEMENT BOARD—fire-safe and wear-proof—forms casing walls and wide, functional louvers that characterize Class 600's.

MARLITH PRESERVATIVE TREATMENT is life-insurance for tower lumber. Applied after fabrication, every piece of wood is deeply and thoroughly impregnated with toxic, proven protection against rot and decay.

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The Marley Company

News of the South-Southwest — more power . . . more plants . . . more money

$1.5 Million Cessna Expansion

Cessna Aircraft Company has announced expansion plans for the firm's Industrial Products Division in Hutchinson, Kans., which will involve an expenditure of more than $1,500,000.

Neil P. Whitney, general manager of the Industrial Products Division, said the total expansion would involve 158,000 sq ft of floor space, more than doubling the size of the present plant.

Construction will include a 130,000 sq ft addition to the present plant, a 10,000 sq ft engineering building and an 18,000 sq ft experimental laboratory building.

The present plant occupies 120,000 sq ft of floor space and the additional construction will give the Hutchinson operation a total area of 278,000 sq ft of working space.

Contractors from both Wichita and Hutchinson will handle the construction after architects' drawings have been completed.

Mann & Company of Hutchinson and Wilson & Company of Salina, are serving as the architects. They also completed the engineering study on the proposed expansion.

Hanchett Opens in Alabama

The Hanchett Manufacturing Company of Big Rapids, Michigan and Portland, Oregon has completed a new branch office, factory and warehouse located at Fifth Avenue South and Thirty-First Street, Birmingham, Alabama. Complete stocks of all Hanchett products, such as saw sharpeners, knife grinders, saw swages and swage shapers will be maintained at the new branch and factory. Complete service facilities are available.

Disston Plant Underway in Va.

H. K. Porter Company, Inc. has announced that ninety acres, just outside of Danville, Virginia, will be the site of a new $1,200,000 plant for the **Disston Division.**

The Disston plant is to be a one story, steel and masonry structure affording 155,000 sq ft of floor space, will be constructed by the Danville Area Development Foundation and leased to Porter on a 25 year basis. Porter has purchased 70 acres adjoining the plant site for possible further expansion. Target date for completion of the plant will be early September, 1959.

Administrative offices will remain in Philadelphia, as will part of the industrial tool production facilities.

U. S. Gypsum in Operation at Houston

A multi-million dollar plant to serve the building industry along the Gulf Coast was recently opened officially at Galena Park in Houston, Tex. by **United States Gypsum Company.**

The new plant lies along the Houston Ship Channel adjacent to United States Gypsum's paper mill which was completed three years ago. From the gypsum plant will come enough building materials — plaster, gypsum boards, including wallboard and sheathing — to finish the walls and ceilings of more than 100 homes a day.

The new gypsum manufacturing plant has four departments housed in three separate buildings, plus dock facilities and a huge storage shed. Hugh Swaney, Plant Manager, said the shed will hold more than 40,000 tons of crude gypsum.

Paint Plant for Georgia

Construction of a new **United States Gypsum Company** paint plant and warehouse is scheduled to begin this spring in the Atlanta area. The new building will be located at 4859 New Peachtree Road in the Chamblee industrial area. Patillo Construction Company, Decatur, Georgia, has been awarded the construction contract.

The plant will manufacture Perf-A-Tape Joint Cement for finishing wallboard and USG Texture Paint. The remainder of the building will be used as a warehouse for the company's complete line of Texolite paints.

This will be United States Gypsum Company's first paint plant in the Southeast, according to C. H. Shaver, Chairman of the Board, and will serve Georgia, Florida, South Carolina, Alabama, Mississippi, and parts of Tennessee and Louisiana.

Fiberglass Plant

Underway for **Razorback Fiberglass Corp.** is $100,000 manufacturing facility on a 55 acre site in Malvern, Ark.

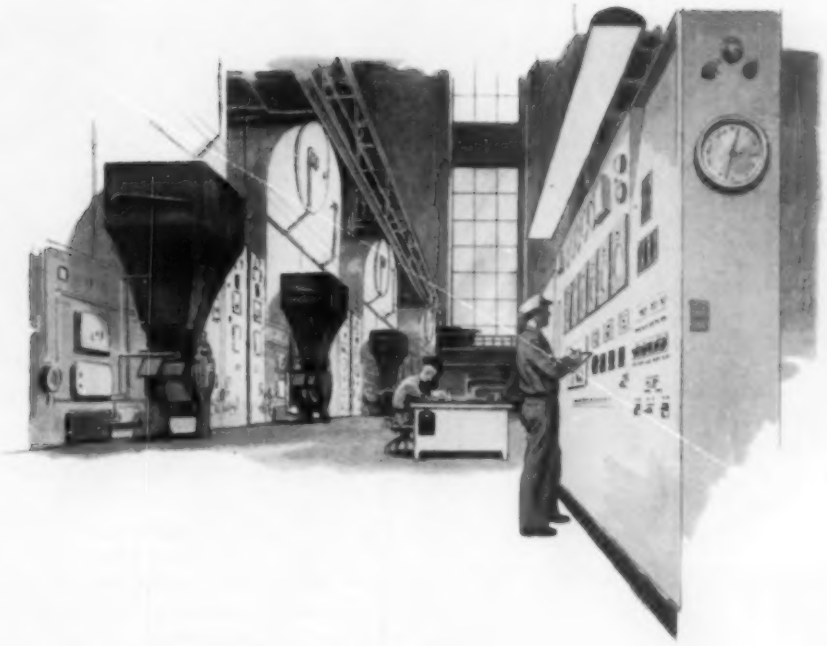
The company's present output is exclusively boats, but additional articles will be manufactured in the new facilities.

Vice presidents **Harry E. Brown, Jr.** and **James Cripps** will actively operate the plant.

Mobay Expands W. Va. Facilities

Plans for a 50 per cent expansion of production capacity for tolylene diisocyanate (TDI) have been announced by **Mobay Chemical Company** with completion scheduled for early 1960. TDI is one of the basic chemicals used in the manufacture of urethane foam cushioning and insulating materials, elastomers and industrial coatings.

This will be the second major expansion of Mobay's plant at New Martinsville, W. Va., since it went on stream in 1956 and will increase the capacity of its TDI facilities to 18 million pounds a year.



We've helped a lot of companies cut cost per 1000 lbs. of steam!

Over the years we've helped many companies achieve greater efficiency from their equipment and cut production costs per 1,000 lbs. of steam.

In many cases, the wrong type or grade of coal had prevented these companies from achieving maximum economy. If you feel that your steam costs are high, contact one of the Norfolk and Western coal bureaus listed on this page. Our coal engineers will check with you on your boilers, stokers, and other equipment, then recommend coal with the exact physical, chemical and burning characteristics to give you best results.

Of the many top-quality coals mined along the lines of the Norfolk and Western, there is one that ideally suits your needs. Mined, prepared and transported by the most up-to-date methods, these coals have aptly been termed "Fuel Satisfaction." Find out how they may be able to cut your fuel costs. Contact one of our coal bureaus today.

Write, wire or call one of these

N&W COAL BUREAUS:

ROANOKE
N&W Coal Traffic Dept.
Telephone Diamond 4-1451
Ext. 3313, 423, 3249, 3732
Roanoke, Virginia

BOSTON
833 Chamber of Commerce Building
Telephone Liberty 2-2229
Boston 10, Massachusetts

CHICAGO
660-664 Marquette Building
140 S. Dearborn Street
Telephone RAndolph 6-4634
Chicago 3, Illinois

CINCINNATI
913 Dixie Terminal Building
Telephone DUnbar 1-1325
Cincinnati 2, Ohio

CLEVELAND
Room 722,
The Illuminating Building
Telephone MAin 1-7960
Cleveland 13, Ohio

DETROIT
1514 Book Building
Telephone
WOodward 1-2340 or 1-2341
Detroit 26, Michigan

ST. LOUIS
2059 Railway Exchange Building
Telephone MAin 1-1180
St. Louis 1, Missouri

WINSTON-SALEM
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CARRIER OF FUEL SATISFACTION

One Of The Many Features Of The

RILEY TURBO FURNACE

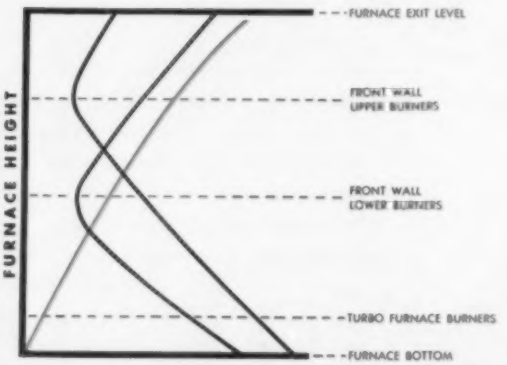
Power Engineers of central stations and of large industrial power plants visiting a Riley Turbo Furnace installation burning coal are impressed at the remarkable cleanliness of the furnace . . . a major reason why more and more Turbo Furnace Boilers are being purchased. Ability of the Turbo Furnace to remain slag-free eliminates the need for slag blowing equipment and sustains an efficient furnace performance indefinitely.

Opposed firing into the Turbo Furnace hearth develops intimate mixing of fuel and air, rapid combustion at high temperature. Coals with widest range of ash fusion temperatures, ash and sulphur content, are suitable. Furnace walls stay clean because combustion gas rises vertically out of hearth in uniform stratum without turbulence and fills entire furnace cross section.

RILEY STOKER CORPORATION
WORCESTER, MASSACHUSETTS

Sales Offices

Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Houston, Jacksonville, Kansas City, Los Angeles, New Orleans, New York, Philadelphia, Pittsburgh, Portland, Salt Lake City, San Francisco, Seattle, St. Louis, St. Paul, Syracuse, Worcester.

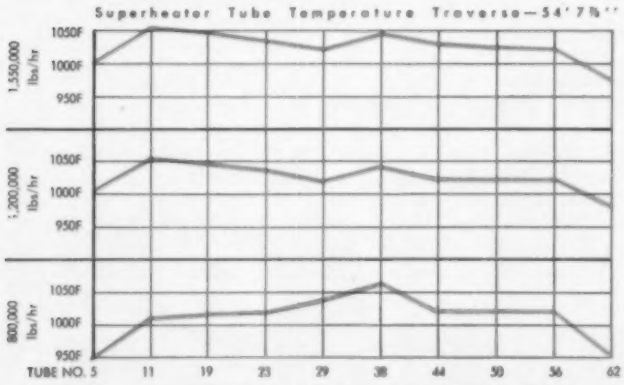


A comparison of temperature characteristics between wall firing and Turbo Furnace firing. Note with Turbo Furnace firing (red curve) highest temperature is at furnace bottom.

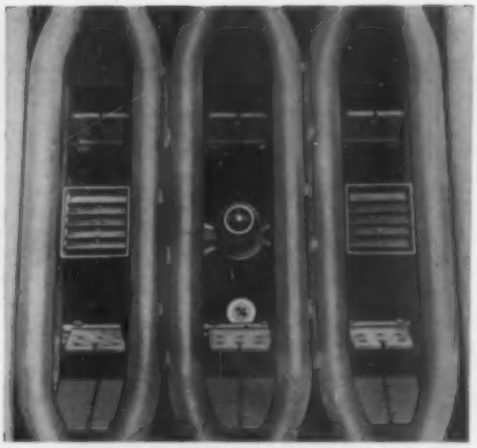
A few of 20 Burners in a 1,550,000 lb/hr Turbo Furnace Boiler. This is a 56 foot wide single furnace.

THERE ARE OTHER TURBO FURNACE ADVANTAGES, TOO!

- **Tops For Multifuels** Combustion of coal, oil, gas, fluid coke, produces substantially equal furnace performance resulting in equivalent furnace exit temperatures, simplifying steam temperature control.
- **Eliminates The Flyash Disposal Problem** Reinjected flyash is removed as an easily handled, commercially useful, quenched slag; in some instances flyash from adjacent dry-bottom boiler can be disposed of in the Turbo Furnace.
- **Extra Wide, Undivided Furnaces Are Possible** The opposed method of Turbo Furnace firing removes limitations on furnace width inherent with other methods of firing.
- **Less Space Required** The permissable higher heat release of the Turbo Furnace results in smaller structures for a given capacity.
- **One Level Operation** All Turbo Furnace burners are at one operating level — usually common with the turbine operating level.
- **Minimum Superheater Metal Temperature Variations** Linear flame from side wall to side wall produces uniform heat release throughout the entire furnace width. Furnace gases rise evenly and vertically within the furnace, resulting in a flat gradient of the skin metal temperatures of superheater and reheater tubes.



Curves Plotted From Readings Taken In Tests Conducted July 22, 1958



The Riley Directional Flame Turbo Furnace Burner is a shop assembled unit which can be equipped complete with coal, gas, oil burners and automatic gas ignitors. Adjustable vanes direct air to control flame placement. No refractory is needed.

A highly turbulent linear flame with long residence time of combustibles results from downward opposed firing. Carbon loss is negligible.

The cooled slag pool of a shut-down unit returns to molten stage when unit returns to line. Note slag discharge opening and flyash reinjection ports.

A survey of your plant by a qualified consulting engineer could show ways of making surprising savings in your power costs.

RILEY
STEAM GENERATING & FUEL BURNING EQUIPMENT

$15 Million Expansion for General Shoe

General Shoe Corp. has begun a $15,000,000 Nashville, Tenn. expansion program which will develop over the next five years. Construction will take place on a 50-75 acre tract made available by the City.

Plans include: 1959—erection of an 80,000 sq ft men's shoe manufacturing plant at a cost of $1,000,000; 1960—80,000 sq ft women's shoe manufacturing plant costing $1,000,000; 1961—80,000 sq ft shoe manufacturing plant to cost $1,000,000; 1962—200,000 sq ft distribution center and warehouse to cost $1,000,000; and 1963-1964—200,000 sq ft office building costing $3,500,000. Machinery, equipment, etc., will add $7,500,000 to the development.

Seed Plant Underway for Ferry-Morse in Ky.

Nearing completion in Fulton, Kentucky is a new seed plant for **Ferry-Morse Seed Co.**, which will be the headquarters of its Packet Division.

The one-story building, occupying a 25 acre area, is a concrete-slab structure, and includes 240,000 square feet in plant space and a 10,200 square foot air-conditioned office. The office will employ around 40 full-time workers, and the plant around 150 workers full-time and an additional 100 seasonally.

The City of Fulton holds title to the land and buildings of the new seed plant, which it has leased to the Ferry-Morse Seed Co. for a term of 15 years, with an option to renew for an additional 25 years.

PLANT PERSONNEL

Engineering-Management Promotions Announced by Major Southern Plants

Michigan Chemical Corp. has appointed **Bruce L. Dwiggins** production superintendent of its new magnesium oxide plant at Port St. Joe, Fla. **Charles R. Jacoby** will be process engineer, and **Charles E. Ewing** will be control chemist.

Bob C. Main has been named manager of American-Marietta Co.'s concrete products plants in the Kansas City, Mo. area. He succeeds Gus Main, founder, who will continue to represent the company as Sales & Management Consultant.

New Louisville, Ky. plant superintendent for General Mills, Inc. is **Richard N. Eddy**, replacing **James W. Speers**, who has been transferred to West Chicago where a new specialty products plant has recently opened.

G. T. Willey succeeds **Edward G. Uhl** as Vice President and General Manager of Martin-Orlando, Orlando, Fla.

Maintenance Engineering Corp. of Houston, Tex. has named **C. W. Gautier** as General Manager; **B. I. Thorngren**, Engineering Vice Pres.; and **W. H. Leverett**, Mechanical Engineering Vice Pres.

Robert T. Hanna has been promoted to General Manager of the Louisville, Ky. Sealtest Foods Div. of National Dairy Products Corp., succeeding **John H. Stark, Jr.**, who has retired.

FUTURE EVENTS of Engineering Interest

Sept. 17-19: 41st Annual Meeting, Public Utilities Assoc. of the Virginias. The Greenbrier, White Sulphur Springs, W. Va. Robert W. McKinnon, Exec. Secy., PUAV, 602 First Federal Bldg., Roanoke, Va.

Sept. 21-22: 57th Fall Meeting, Steel Founders' Society of America, The Homestead, Hot Springs, Va. SFSA, 606 Terminal Tower, Cleveland 13, Ohio.

Sept. 27-30: 3rd Annual National Power Conference: ASME and AIEE, co-sponsors; Hotel Muehlebach, Kansas City, Mo. Fred P. Gilpin, Kansas City Power & Light Co., Box 679, Kansas City 41, Mo.

Sept. 28-Oct. 1: Fall Meeting, American Welding Society, Sheraton-Cadillac Hotel, Detroit, Michigan. AWS, 33 W. 39th St., New York 18, N. Y.

Oct. 22-25: Annual Meeting, American Society of Industrial Designers, Grove Park Inn, Asheville, N. C. ASID, 15 E. 48th St., New York 17, N. Y.

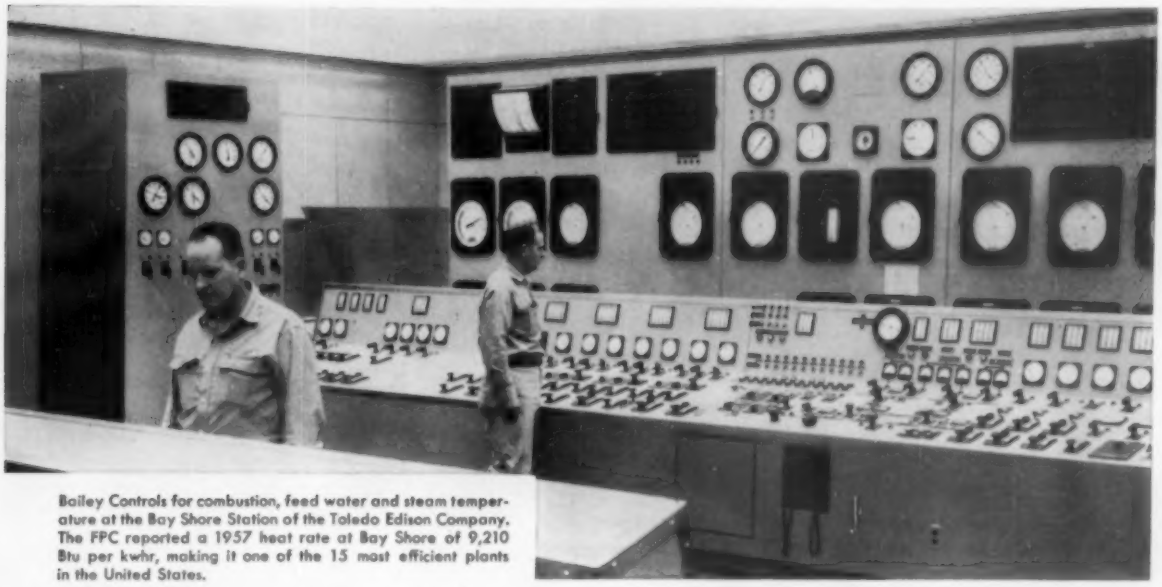
Nov. 16-20: 5th International Automation Exposition & Congress, New York Trade Show Bldg., 500 Eighth Ave., New York, N. Y. Richard Rimbach Assoc., Inc., 845 Ridge Ave., Pittsburgh 12, Pa.

Albritton Expands

Albritton Engineering Corporation of Bryan, Texas, has occupied an additional 76,000 sq ft building only 21 months after moving into a 36,500 sq ft building.

The "straight line" method of production is used in the plant whereby raw material is fed into the plant at one end and processed thru to the other end where it emerges as finished product ready for shipment.

Three series of products are currently in production in the two Albritton plants. These are aluminum single hung windows and sliding windows for residential and commercial use and window walls for commercial use.



Bailey Controls for combustion, feed water and steam temperature at the Bay Shore Station of the Toledo Edison Company. The FPC reported a 1957 heat rate at Bay Shore of 9,210 Btu per kwhr, making it one of the 15 most efficient plants in the United States.

13 of 15 "most efficient"* power plants depend on Bailey Meters and Controls

Year after year you'll find Bailey Meters and Controls keeping sensitive fingers on the pulse of America's *most efficient* power plants (as rated by the Federal Power Commission.

According to the latest box scores, 10 of the top 15 used Bailey equipment exclusively. There must be a reason. There is! In fact, several:

1. Experience—Bailey Engineers have been making steam plants operate efficiently for more than forty years. They bring you the latest, up-to-the-minute developments in measurement and control.

2. Complete Line—Bailey manufactures a complete line of pneumatic and electric metering and control equipment, proved on thousands of successful installations.

3. Sales and Service—There's a Bailey District Office or Resident Engineer close to you (listed under Bailey Meter Co. in your phone book). Phone for expert engineering counsel.

* 15 MOST EFFICIENT PLANTS • 1957 Heat Rates Reported by the Federal Power Commission

	Btu/kwhr	Meters	Comb. Control	Feed Water Control	Supht. Control
1. Kanawha River (Appalachian Electric Power Co.)	9,118	B	B	B	B
2. Muskingum River (The Ohio Power Co.)	9,139	B	B	B	B
3. River Rouge (The Detroit Edison Co.)	9,140	—	—	—	—
4. Clifty Creek (Indiana-Kentucky Electric Co.)	9,147	B	B	B	B
5. Tanners Creek (Indiana and Michigan Electric Co.)	9,180	B	B	B	B
6. Kyger Creek (The Ohio Valley Electric Corp.)	9,201	B	—	B	B
7. St. Clair (The Detroit Edison Co.)	9,210	B	B	B	B
8. Bay Shore (The Toledo Edison Co.)	9,210	B	B	B	B
9. G. G. Allen (Duke Power Co.)	9,349	B	B	B	B
10. John Sevier (Tennessee Valley Authority)	9,350	—	—	—	—
11. Phillip Sporn (Central Operating Co.)	9,370	B	B	B	B
12. Milliken (New York State Electric and Gas Co.)	9,371	B	—	B	—
13. Shawville (Pennsylvania Electric Co.)	9,396	B	—	—	B
14. El Segundo (Southern California Edison Co.)	9,467	B	B	B	B
15. Colbert (Tennessee Valley Authority)	9,490	B	B	B	B

A141-1

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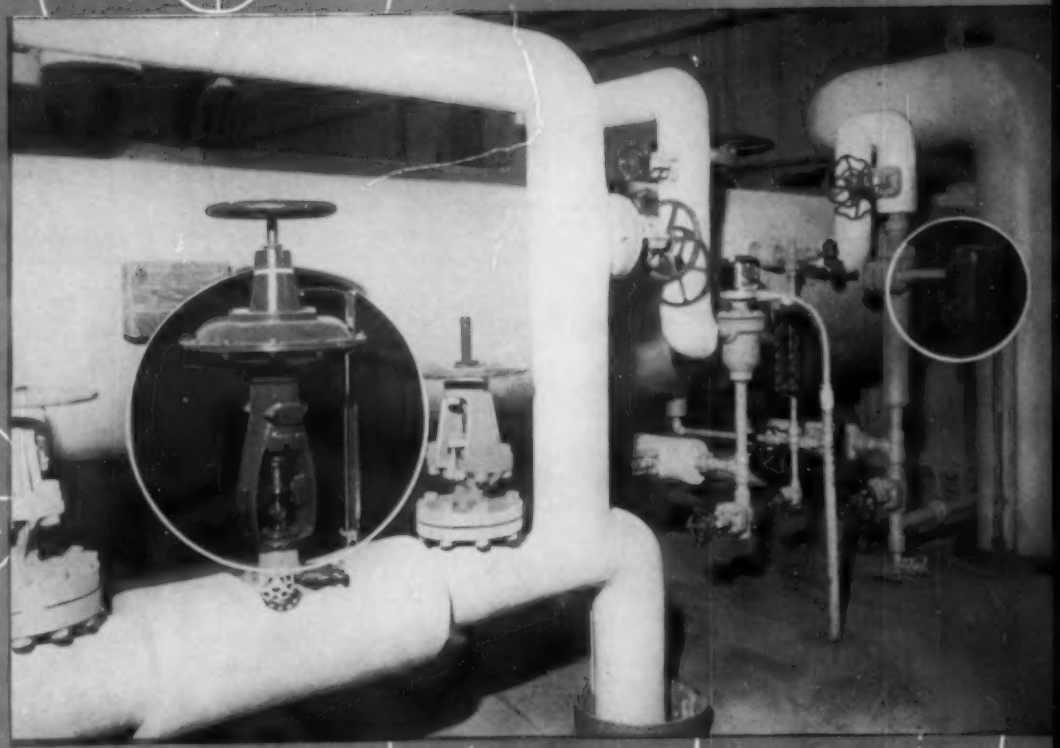

This is a Masoneilan Control Valve and Liquid Level Control in heat exchanger service at a southern power plant.

TYPICAL APPLICATIONS

- Feed Water Recirculating
- Desuperheater Temperature and Pressure
- Turbine Bypass, Reheat and Exhaust to Process
- Condenser and Deaerator Level
- Heater Drains
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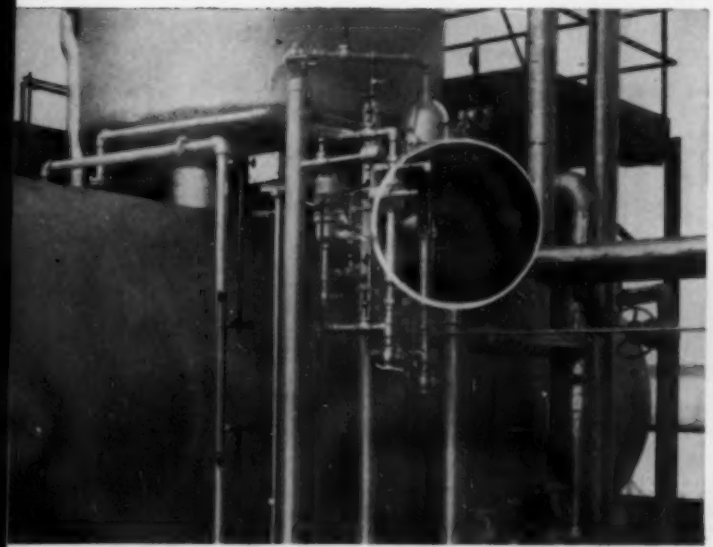
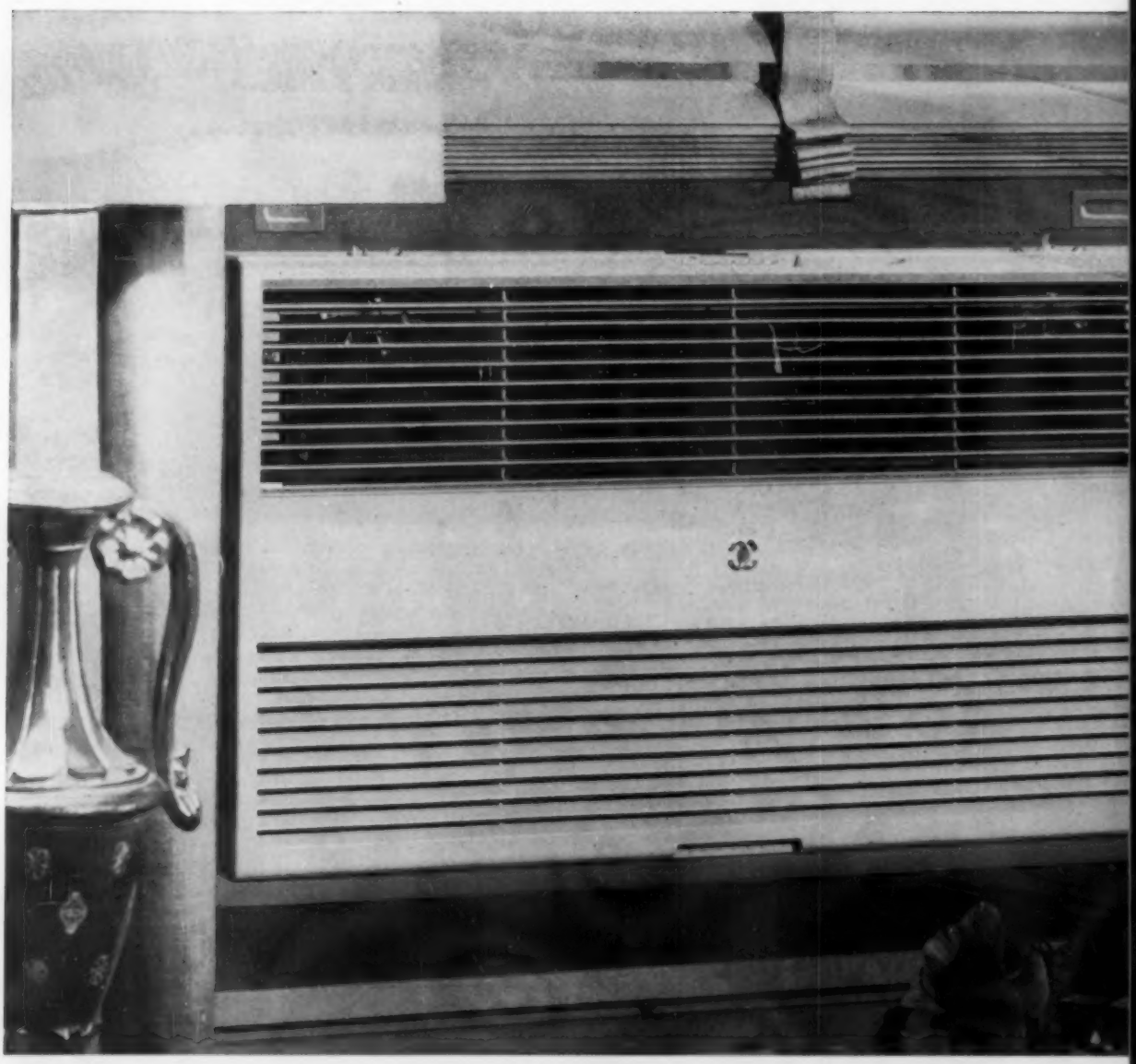
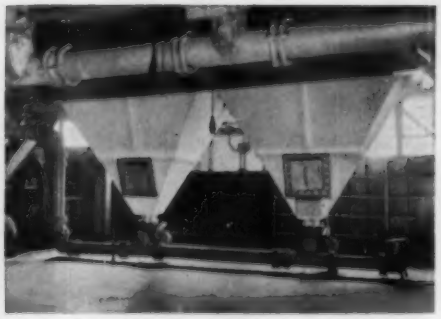


Masoneilan Liquid Level Controls in Deaerator Service at a southern power plant.

America's historic Atomic Power Plant at Shippingport, Pa. uses these Masoneilan Control Valves for Flash Tank Surge and Blow-Off Tank.



General view of Carrier power plant. Boilers on right are bent tube, two-drum types, by Riley Stoker Corp. burning pulverized coal. Coal moves from bunkers to Riley Pulverizers (at left in photo) and then into furnace.



Mechanical dust collectors by Prat-Daniel Corp. help assure cleanliness of operation. These collectors tie in with United Conveyor ash handling system for movement to ash silo and final disposal.

Pneumatic automatic control panel by Bailey Meter Co. regulates combustion operation of all boilers and auxiliary equipment, maintains continuing steam generation efficiency!

Carrier puts the chill on fuel costs...with coal

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An unusual team—the heating ability of coal and the cooling facility of air conditioning equipment! Yet Carrier Corporation, Syracuse, N.Y., found this combination profitable when expansion plans required additional capacity in its steam plant. After engineering surveys, Carrier decided to continue burning coal for economy of operation. Today modern power equipment supplies steam *economically* for heating, air conditioning and processing. Original fuel costs plus automatic operation within the power plant hold overall steam costs to a minimum.

Coal is lowest cost fuel

Today, *when the annual cost of fuel often equals the original cost of the boilers,* you should know that bituminous coal is the lowest cost fuel in most industrial areas. And modern coal-burning equipment gives you 15% to 50% *more* steam per dollar, while automatic operation trims labor costs and eliminates smoke problems. What's more, tremendous coal reserves and mechanized mining procedures assure you a constantly plentiful supply of coal at stable prices.

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To help you with fuel problems, the Bituminous Coal Institute offers a free technical advisory service. We welcome the opportunity to work with you, your consulting engineers and architects. If you are concerned with steam costs, write to address below or send coupon. Ask also for our case history booklet, complete with data sheets. You'll find them informative.

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If you are remodeling or building new heating or power facilities, it will pay you to consult a qualified engineering firm. Such concerns—familiar with the latest in fuel costs and equipment—can effect great savings for you with the efficiency and economy of coal.

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Coal is loaded into silos before it moves to bunkers. At left is the ash silo which utilizes rotary dustless unloader in loading trucks for disposal. Silos and conveyors are by Fairfield Engineering Co.

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INDUSTRY SPEAKS

Water Not Everywhere

INDUSTRIAL plants in the United States are using 100 billion gallons of water every 24 hours, and the growing demand indicates that within the next 25 years water will be this nation's most critical commodity, it was stated recently at the special conference in New Orleans on the development of southern industrial water resources. More than 400 business and community leaders from the South were in attendance.

DR. CHARLES H. DAVENPORT of El Dorado, Ark., assistant research director for the Lion Oil Division of Monsanto Chemical Company, speaking on "The Uses of Water in Industry," also pointed out that "water is one of the prime factors in the selection of sites for new and expanding manufacturing enterprises — and along this line the South has many advantages." He added that water is now a "veritable necessity and even a building block for our basic industries and the majority of our manufacturing plants."

Co-sponsored by the Mississippi Valley Association and eleven companies and organizations in the lower Mississippi valley, the one-day conference was called to clarify and publicize the importance of the area's water resources to future industrial growth and agricultural stability.

Referring to the problem of pollution, Dr. Davenport stressed that the quality of water and its suitability for industrial purposes were often determining factors. "Purification of water prior to its use is often an expensive phase of plant processing, and this cost can mean the difference between profit and loss for the manufacturer," he stated.

A native of British Columbia, Canada, Dr. Davenport became a naturalized citizen in 1948, and joined the Lion organization the same year. He has had four U. S. patents in the chemical field issued to him.

The meeting in New Orleans was the fourth of a series of similar conferences being held in a 23-state area comprising the various river basins of the Mississippi River system. Emphasis is being given to the value of controlled water resources and the problems facing continued water reserve development. The next conference is slated for St. Louis in the near future.

Utility Foresight Praised

THE BOLDNESS and pioneering foresightedness of the nation's utility companies, combined with technological advancements by the steam generating industry, are credited with keeping the price of electrical power consistently steady in the face of continually rising material and labor costs.

Speaking at the new Thos. H. Allen Electric Generating Station in Memphis to the Tennessee Press Association, JOEL W. THOMPSON, sales engineer of The Babcock & Wilcox Company's Cincinnati district office, stated that the low cost power available to the average citizen in the United States is no accident but the result of a teaming up of the utility organizations and their manufacturing suppliers to increase steadily the efficiency and dependability of our electrical systems to maintain this bargain in continuously available energy.

A great amount of research and development was required to continue to increase the pressures and temperatures at which steam generators and turbines could operate, thereby improving the thermal efficiency of the plant cycles. In addition to the work of the manufacturers in producing these materials which allowed designs incrementally more efficient than previous units, it was necessary that utility companies have the boldness and pioneering foresightedness to invest millions of dollars in equipment unsupported by previous commercial operating experiences.

Citing the new Allen Station, for which Babcock & Wilcox manufactured and installed three Cyclone Furnace-fired boilers, as an example of the progress attained in the electric power field, Mr. Thompson explained that one pound of coal at the plant will produce 1.4 kwh.

In addition to the factors of pressure and temperature which increased thermal efficiency, the growing size of power systems rapidly justified units of higher capacity. As little as ten years ago the largest size steam generating units were only one-half the capacity of these units at Allen Station. One of the ten largest in the United States, considering total electric generating capacity in service, the Allen Station is the largest municipally owned steam generating plant ever built as a single project.

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TIMELY COMMENTS

It's Time for the Buyer to Complain

IF YOU CAN'T get exactly what you want to buy — raise Cain. Not only will you be serving your own company well, but you will be doing the vender a much needed service.

Too frequently, the readily available types and models are too elaborate, too fancy and too high. On the other hand, they may not be good enough or not well suited to the buyer's needs. In such cases shop around — you may find exactly what you want at the right price.

But failing to find it, turn to your favorite supply sources and explain your needs. If you don't want fancy finishes and frills, ask that they be eliminated, and the price cut accordingly.

Remember, your suppliers really want to serve you; you are their bread and butter. But some have gone overboard in their efforts to produce sales appeal and have come up with monstrosities. Looking for "something new to sell," too many have made changes merely to be different. And the changes are not always genuine improvements. Tell them about it, and tell them why you don't like it.

Conversely, particularly on heavy mass produced products, changes are expensive and manufacturers are reluctant to make changes in product lines unless they know exactly what their customers want. In such cases, tell them what you want; tell them what changes to make. And if the new design tailored to your needs is more expensive, tell them how much you can pay for it.

But frequently the customers' desires could be met without increase or at less cost if the manufacturer just knew his market requirements. Tell them what you want — even the best market analysts are not mind readers.

The wonders of automation are many, but the tail should not be allowed to wag the dog. Changing design to facilitate automatic production is tricky business. For example, the gas tanks on new cars are inconspicuous and no doubt easy to produce, but they leak. The neck of the filler opening is too short or something. Anyway, they leak if the car is parked on uneven ground.

Similar boners creep into industrial machinery design. Expensive equipment from reputable manufacturers does not necessarily function perfectly. Tell them about it. Help them to make changes for better rather than for worse.

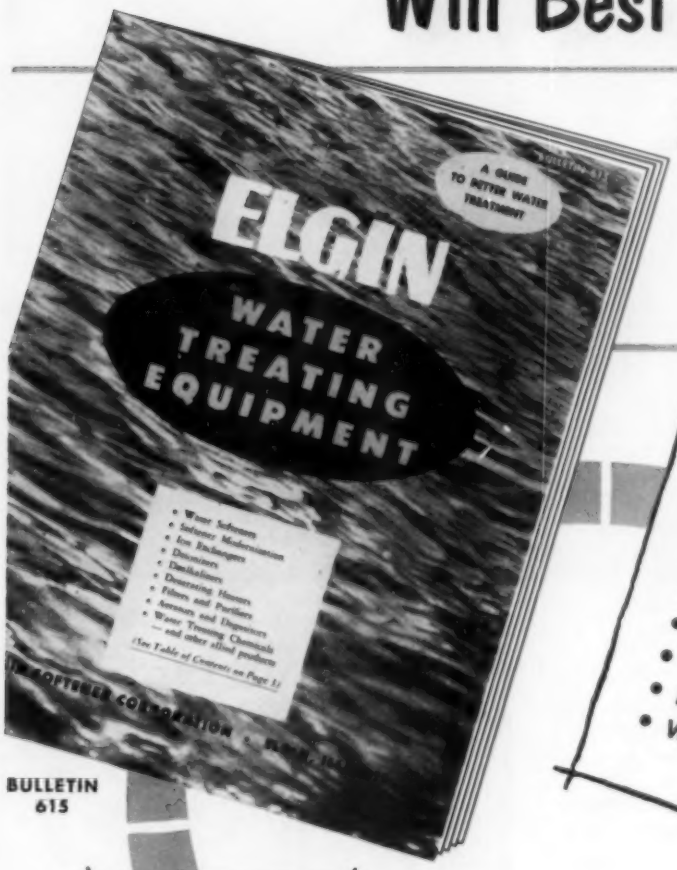
Many buyers are too complacent. They take what they can get, rather than what they want. Buyers of consumer goods are the same way. They buy what is put before them without doing a thorough shopping job.

If you refuse inferior or unapplicable products and demand what you need, you will eventually get it. But it sometimes takes patience and persistence.

Industrial purchasing is not easy. You can get much help from excellent representatives of top quality manufacturers. But first, the purchasing engineer must know what he wants. And then he must tell them about it. And if necessary, shop around. See what's available. Get what you want.

Just one word of caution. Next time a good salesman comes to see you, listen to him. Because of his wide knowledge and experience serving many plants, he may know your needs on certain items better than you do.

Which Water Treating Equipment Will Best Fit the Job?



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If you are confused about the many ways to treat water, this new bulletin will help you decide which is best for the job. It describes the various equipment used in treating water and what each is designed to do. Known for quality, dependability and advanced design, this equipment is based upon 50 years experience. For practical guidance in its proper application, the services of the Elgin representative nearest you is yours for the asking.

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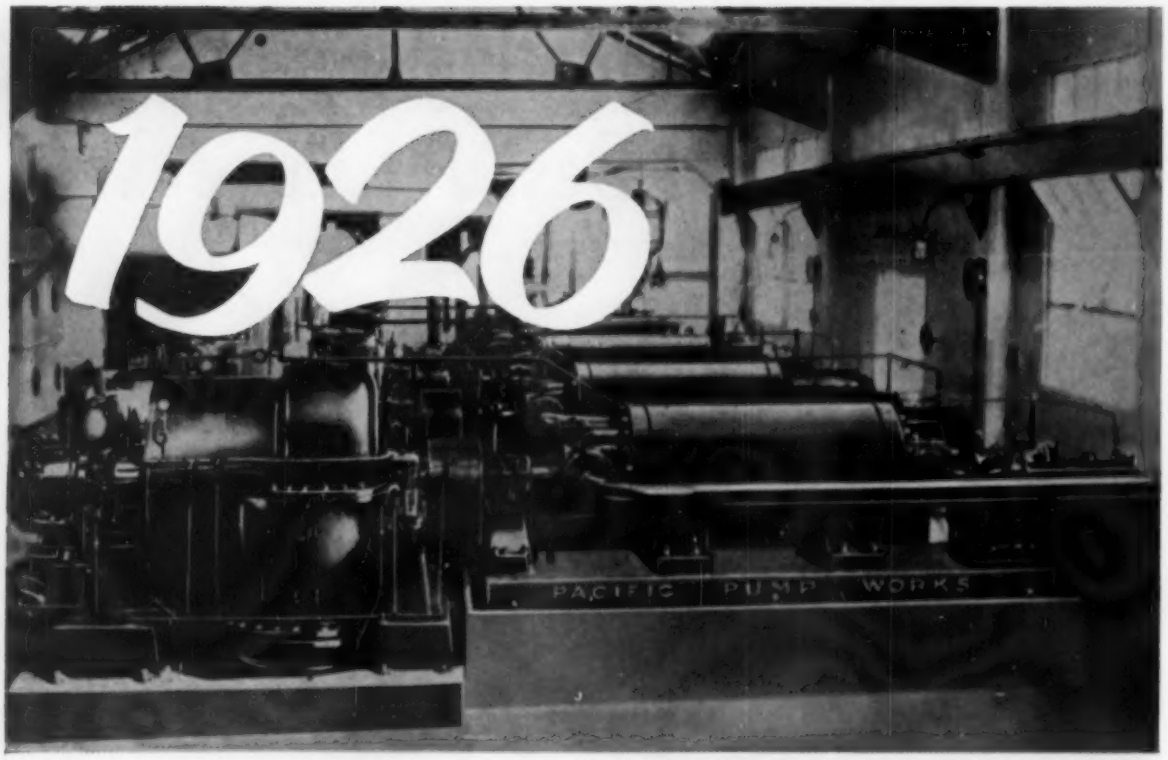

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first "FIRST"

The centrifugal pumps designed and built for Pan American Oil Company's new high-pressure cracking process in 1926 was one of the most significant engineering achievements of the Twenties in the refinery processing field. The first of many Pacific Pumps' "FIRSTS", this particular pump was the forerunner of today's greatly improved Pacific centrifugal process pump line. Over the years Pacific has built and installed thousands of vertical and horizontal centrifugal pumps for extreme pressures and temperatures demanded by the petroleum, chemical, petro-chemical and allied industries. In addition, Pacific designs and manufactures boiler feed pumps for the power industry, steam turbo-pumps for the marine and power generation fields, and plunger pumps for oil-well service.

This first Pacific advertisement appeared in several petroleum publications early in 1927

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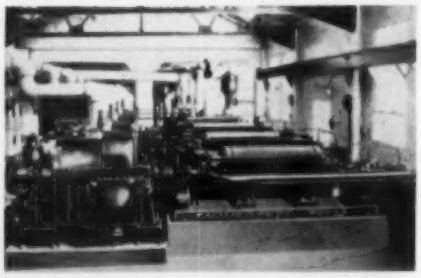

View of recent installation of four "PACIFIC" Multi-stage Pumps at Pan American Petroleum Company Refinery, Los Angeles. Each Pump delivers a capacity of 400 Gallons Per Minute of Oil against a pressure of 2000 pounds. Pumps are driven by 750 H. P. Steam Turbines. Each Pump weighs nine tons and was required to pass a hydrostatic test of 5000 pounds pressure.

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New Russellville, Kentucky Plant Designed to Cut Production Cost Without Excessive Capital Outlay

Limited Automation Combined With Specialized Materials Handling

COMPANY-WIDE increases in use of aluminum governed the design of Rockwell Manufacturing Company's new plant at Russellville, Kentucky.

The first plant to be built especially for aluminum die casting operations, its layout and facilities were designed for efficient operation in current production and rapid expansion as the company's use of aluminum grows. Machining facilities are planned for a gradual increase in automation as expanding production volume justifies the cost of automated equipment.

About eight years ago Rockwell initiated a research and development program for systematic review of its product engineering to determine new uses of aluminum. Uses discovered among 19 product lines — 25,000 sizes and types — eventually made the Russellville die casting plant feasible.

In most cases where aluminum was substituted for other metals there was no single compelling advantage that made aluminum essential. Substitutions were the result of general efforts to cut costs and improve products without increasing prices.

The plant now casts more than a hundred different components for meters, valves, power tools, and other products assembled in other company plants. These castings were previously purchased.

The plant can melt and cast up to three thousand pounds of metal per hour. Castings range in size up to 21 pounds, the largest pressure aluminum die casting made. All castings are machined before shipping. About 155 employees work at the plant.

Limited Automation

The entire process for melting the aluminum, delivering it to die casting machines, and returning imperfect castings to the furnaces is so nearly automated that one operator performs all the work. The largest of the ten die casting machines is automatically fed.

Most of the castings are finished on special drill press setups that perform several operations, including milling and tapping, simultaneously or in sequence.

Handling Mechanized

The building is a T-shaped structure with the foundry in the leg of the "T" and the machine department at the top. At one end of the foundry is the furnace room. Three electric furnaces of 1,000 pounds capacity each are imbedded in the foundry floor and there is space for three more in the same line. The furnaces are charged with raw billets handled by a fork truck and from a reject conveyor line.

Furnaces are emptied into a bull ladle which is handled by a crane running the entire length of the 275 foot long foundry area. The man who charges the furnace also operates the crane car and delivers the molten metal to the die casting machine. The largest machine, which casts the 21 pound meter body is equipped with an automatic ladling furnace. Its output is 50 pieces per hour.

There are five machines, each with its own holding furnace, on either side of the crane line. There is space for ten more machines along the line. Die casting machine operators inspect each finished piece and place them on a conveyor which runs under a catwalk between the two rows of machines. Castings are stacked on pallets at the end of the line.

Pieces rejected in inspection are placed on the lower level of the conveyor belt which carries them back to the furnace room. Here, they are channeled ninety degrees onto an ascending conveyor which carries them behind the furnaces.

Scrap is stored either on the ascending conveyor or in two weighing hoppers suspended above it which may be lowered so that rejects from the conveyor fill them

MATERIALS HANDLING

Handling of raw stock in the Russellville plant is completely mechanized. One man performs all operations in the furnace department: charging and controlling furnaces, loading bull ladle, delivering metal to die casting machines, and returning scrap to the furnaces. Three one-thousand pound furnaces are used.

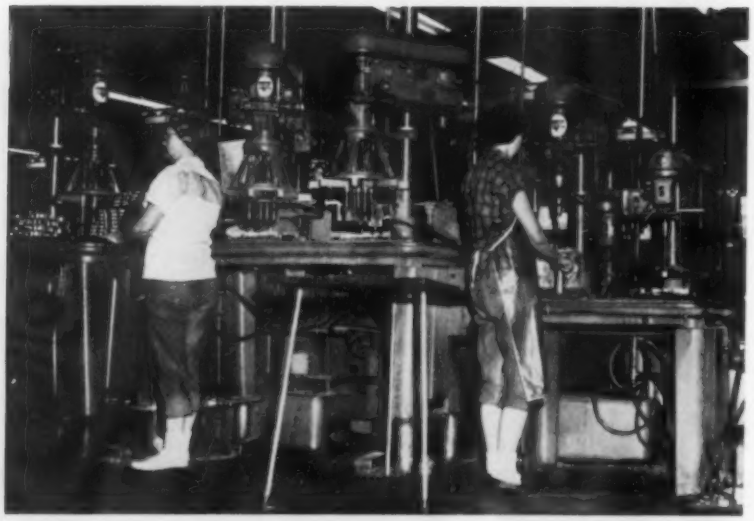
Die casting machine metal pots are fed from the bull ladle which is carried by crane running the entire length of the foundry area. The operator, riding in the cab, takes care of all handling operations.

Scrap is returned to the furnace department on the lower half of the conveyor (extreme right) which carries the finished product to the storage area. Scrap is stored on ascending conveyor and hopper above it. To charge one of the three furnaces, the operator uses the horizontal extending conveyor which is directed into the furnace. This unique system is completely automatic.

Ten die casting machines are on either side of conveyor line. Machine at left has automatic ladling for 21 pound pressure die casting. Output is 50 pieces per hour. Space is provided for ten more machines as expansion justifies their installation.

LIMITED AUTOMATION

At right, upside drill press, equipped with pneumatic feed and ten-spindle multiple-head, drills ten holes in meter body while adjacent drill press, equipped with pneumatic feed, ten-spindle multiple-head and reversing motor, taps holes in a piece previously drilled. Both operators simply load and unload and operate foot pedals.



Another "low-cost automation" setup is operated as a two-girl production line. 17 holes are drilled and tapped in 151 pieces per hour on six tools.

Four-spindle drill press production line drills and taps holes in top and side of meter covers. All four tools are controlled by foot-operated pneumatic feed devices so that operator simply loads and unloads. At left, two spindles drill and tap four holes in 272 pieces per hour. At right, one spindle drills 12 holes while the second taps 8 in 194 pieces per hour.

Because production volume doesn't presently justify complete automation, the Russellville plant uses "low-cost automation," the combination of simple tools with automatic controlling device to perform multiple-step operations with minimum in-between handling.

automatically. Rejects are returned to the furnace from this storage point by an extending conveyor which is directed into the furnace to be charged.

Machining Department

Current Russellville volume doesn't merit full-scale automation. As a substitute, the tool men have devised setups that combine operations. There is no transfer mechanism or feed back in these setups as in a full-scale automation machine, but multiple operations are performed in which the operator's duties are limited to loading, unloading and actuating the cycle.

These setups seem ingenious, yet they are made from simple, standard drill press components. One setup is simply an L-shaped row of 6 presses equipped with special tooling to drill and tap 17 holes in a part at the rate of 151 parts per hour. The part is a valve plate.

In another setup, a four spindle drill press production line drills and taps holes in top and side of meter covers. All four tools are controlled by foot-operated pneumatic feed devices so that operator simply loads and unloads. Two spindles drill and tap four holes in 272 pieces per hour. In the other two-tool setup, one spindle drills 12 holes while the second taps 8 in 194 pieces per hour. Similar setups throughout the machine department permit low cost finishing of castings in small lots.

These drill press setups used at Russellville permit Rockwell to set aside special machines for work done in very small lots. Capital investment is small enough that the setups can stand idle most of the time without excessive waste of capital. Because they are designed to combine several operations, to eliminate excessive handling between operations, and to limit work content to loading and unloading, they are several times more productive than work on individual tools.

Russellville's tooling men have become experts in "low-cost automation" and only work on the smallest, most infrequently run lots is done on individual tools.

More Automation Planned

All of the 83 parts cast at Russellville could be finished in completely automated machines and Rockwell management is prepared to convert to automation on any component when volume will justify the investment.

Current plans envision a plant layout in which major castings, now moved on pallets, are conveyorized from casting machines directly to automated machines in the machining department where multiple machining operations and inspection will be accomplished without additional handling.

Ceramic Coatings Restore Shafts and Sleeves

FRETTING corrosion under mechanical seal packing and erosion under conventional packing due to high gland pressures are common reasons for shaft and shaft sleeves being discarded after being in service only a few weeks or a few months.

The plant engineer for a large Southern pulp mill had been working with Chemical & Power Products, Inc., in testing a new ceramic-faced Chempro external seal in one of his slurry pumps and asked them to ceramic-coat several shafts for test.

It is now possible to apply a hard, dense, homogeneous coating to metal shafts and sleeves at a cost far below that of replacement. In a number of applications, brand new shafts and shaft sleeves have been ceramic-coated at the packing area and have far outlasted the bare metal shaft. Relatively soft, self-lubricated conventional packings impart a high polish to the ceramic and give a smooth, cool running operation.

Sprayed coatings are being used to give extremely hard, chemically inert ceramic coatings to shafts, sleeves, pump impellers, piston heads, rings, cams, valves, etc., in usual thicknesses from 0.005" to 0.030".

By R. W. NEEL
Atlanta, Georgia

Controls on the General Electric speed variator at Springs Cotton Mill's Grace Bleachery, Lancaster, S. C.

By
A. R. SWEEN, Supervisor
Speed Variator Sales
General Electric Company

You Also Can Have D-C

Packaged Units Make It Available Right Where You Want It

EARLY in the history of electricity, d-c power was a direct competitor with a-c. With the economics of a-c distribution, however, it soon became apparent that direct current could not compete with a-c for large power distribution systems.

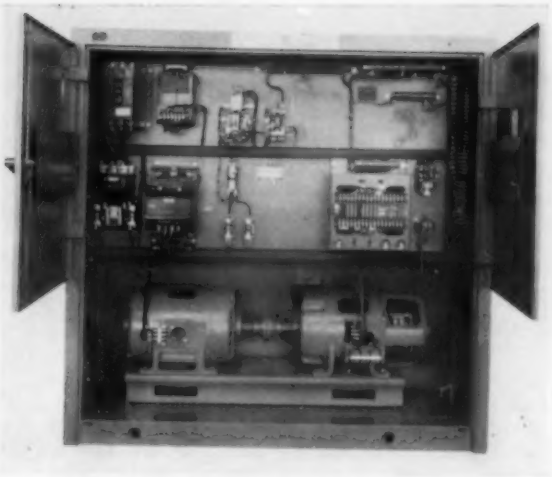
To eliminate the need for d-c distribution and still obtain the advantages of d-c adjustable speed, a-c to d-c power conversion units were used, at or near the location where d-c was required. D-c thus became an a-c load.

Conversion Units

To convert a-c to d-c, three types of conversion units are generally used. The oldest and perhaps still the most common of these is the rotating motor generator set with a d-c generator driven by an a-c motor. By varying the d-c excitation (from a separate a-c powered d-c exciter) to the d-c generator, the d-c motor armature voltage, and hence its speed, can be adjusted. (Figure 1)

More recent in its origin is the electronic rectifier which rectifies a-c power to provide a d-c output voltage. By controlling the point in the a-c cycle at which the rectified current is allowed to flow, the output d-c voltage, and hence motor speed, can be controlled. (Figure 2)

In the past few years, a new type of regulated rectification has begun its climb to popularity. This is the metallic rectifier. When used for adjustable voltage d-c drives, it usually operates in conjunction with a saturable reactor or some other device whose reactance to



ABOVE — Packaged a-c—d-c conversion unit using motor generator set. A-c power leads to circuit breaker supplies all power to the drive. D-c output leads to motor and operator's control are connected to d-c generator and vertical terminal board. Packaged, magnetic amplifier regulator provides speed regulator and smooth, adjustable timed acceleration of 2 d-c motors on a textile range drive.

ABOVE RIGHT — Electronic rectifier d-c adjustable speed drives. Compact rectifier units can be located at the machine to get "on-the-spot" a-c—d-c conversion.

RIGHT — Packaged a-c—d-c conversion using power amplistat with silicon rectifiers (rectifiers mounted on back). Single a-c power input is its a-c circuit breaker. Drive provides smooth acceleration, and adjustable speed for stock washer in a pulp mill.

current flow can be varied and controlled. By controlling the reactance in series with the rectified d-c current, the output voltage, and d-c motor speed, can be controlled. (Figure 3)

Adjustable Speed

Since 1946, the percentage growth of d-c drives has been greater than that of a-c. This growth can be attributed mainly to the need for more accurate and more easily adjustable speed control of a process to obtain maximum output. This means an increased electrical load since d-c drives often compete with or replace old steam engine driven line shaft systems, steam shotgun drives, steam turbine drives or even engine type adjustable speed drives.

Load Center

To minimize the higher cost of d-c power distribution, a-c to d-c conversion units are generally placed as near as possible to the driven load, using a-c load center power distribution. To allow mounting of the conversion unit close to the machine, the trend has been toward the use of a packaged conversion unit with its own air filter system. In this way, the conversion unit can be located within a few feet of the driven machine in most environments.

As demand for goods has increased, many processes have changed from a batch type to a continuous type with several processes taking place at the same time. The change in manufacturing process meant a need for greater coordination between sections and a need for the functions that could be provided by d-c drives. Such functions as speed, tension or position can readily be controlled by a d-c drive and over a wide speed range.

To remain competitive, manufacturers found they must continually increase speeds as speed limiting obstacles in manufacturing processes were overcome. The

(*Continued on Page* 48)

Pencil Pushers and The Laws of Paper Work

MANY A MANAGER has spilled a pint of ink in trying to streamline his operations — to get more work with fewer man-hours (or woman-hours). But the laws of paper work suggest rather strongly that this is only a weak horse to ride. Just as important is continuing to cut out work that is not necessary. Said slightly differently, it is necessary to do the vital paper work with minimum cost and at the same time eliminate all unneeded paper work.

The best way to wrestle with a problem is to learn everything about what is involved. So now seems a good time for some formal statements of the laws which govern paper work. Although these laws may strike a reader as being half-serious, half truths, still the laws and their corollaries should help to diagnose the cancer of overburdensome administrative costs.

By ROBERT HAYS
Associate Professor and
Instructor in Technical Writing
Southern Technical Institute
Atlanta, Georgia

1. The importance of paper work varies inversely (perhaps) as the square root of the number of copies; and consequently, the more people who have to write, process, read, initial, or file a report, the less essential the report is likely to be.

2. The less certain an administrator is of his job, the more forms, reports, etc., he will propagate. The reports and forms therefore offer themselves as defense mechanisms.

Like all axioms and corollaries, these two seem difficult to prove experimentally. It would be much easier simply to cite examples. For example, there is the case of organization X (a state agency). This organization has one particularly vital set of records, records apparently so vital that five distinct originals are maintained of each entry. A visitor would think that surely the entries must be almost "Organization Top Secret." Instead, the entries are accessible to every member of the staff except the janitors, with no questions asked.

Or there is the case of manufacturing concern Y. In one year (1958) this organization ran off more than 25 million copies using a certain well-known duplication process. One would presume that all of these copies must have represented essential data. But hardly so, for the duplication process used is known throughout industry as "poor-man's reproduction" — cheap, quick, and hardly appropriate for the eyes of top executives or customers.

Again, we have the example set by federal government, probably history's most voracious gobbler of paper. In recent years, by the Printing Office's own estimates, production of forms has cost the taxpayers roughly $200 million — about a dollar and a quarter for every man, woman, and babe-in-arms. Other printing has cost $100 million more.

Why Paper Work Grows

Before we cite any specific validations of the two corollaries, let us see why paper work multiplies. Let us apply a chisel to the brain of the paper-bound bureaucrat and see what makes him not tick. Generally, his reasons for the burden of paper work he creates fall into four categories:

1. "Somebody may need this information some day." For simplicity we shall call this the "little man who probably isn't there" reason. And this haystack of an excuse contains just a tiny needle of truth. Once in a while somebody does want some information which even a dedicated bureaucrat could not supply. (We might wonder whether the inquirer really needs or just wishes the information.)

2. "We might lose the other copy, so we need more than one copy." This reason is like the cotton candy sold at the carnival — mostly air, but little substance. Fires may destroy essential records, so sometimes a duplicate is wise. But how can organization X, mentioned earlier, justify quintuplicate records when all five sets are kept in the same room in non-fireproof cabinets?

3. "It doesn't cost any more to make a hundred extra copies." This we can call "the alibi of the rotating mimeograph machine." Once the stencil has been cut and the operator is running off a hundred copies a minute, another hundred copies will not cost over four bits. However, let us look at a tally sheet. Suppose the bureaucrat has one filing cabinet — a four-drawer metal cabinet — full of unnecessary copies. He then has

CAPITAL INVESTMENT

Cost of filing cabinet	$ 65
Cost of Paper	$ 72
Total (not counting work)	$137

ANNUAL EXPENSE

Interest on investment	$ 8
Depreciation (at 10 years)	$14
Cost of floor space	$ 4
Total yearly cost	$26

The only justification for these needless expenses would be that (1) the filing cabinet will cover a broken place in the plaster or (2) Susie Secretary needs the top of the filing cabinet as a place to put her pot of petunias.

And even the humble carbon copy — no duplication equipment required — can run up a bill. Admits the General Services Administration, "Time studies in industry show that the cost in typing time and paper runs from $5.00 to $7.50 a thousand to make carbon copies of letters. The cost of filing the carbon copies runs to at least $100 a thousand copies."

4. "Even if we don't especially need this report, it won't take long to do it." This, probably the most frequently voiced appeal of the pencil pusher, actually holds less water (rather less ink) than any of the others.

If the only reason for preparing a certain record is that it doesn't take much time to do it, why not simply — not prepare it. After all, we can probably stand on our heads in only 4.527 seconds, climb the flagpole in front of the office in only 19.021 seconds, or fold a paper airplane in only 12.677 seconds. But most of us do not perform these operations, because we do not need to perform these operations.

Even Uncle Sam's Government Printing Office says, "A question often more pertinent than the merits of the form itself is the necessity for it, or the efficiency of the procedure which requires its use." The fact that unnecessary work has been squeezed out of an operation suggests that more could be eliminated.

Sometimes a methods study can cut out unnecessary positions. For instance, the Civil Service Commission reported that a study of paper work personnel utilization eliminated 7 filled positions, released 36 stenos and typists for other assignments, and abolished 30 unfilled positions. These changes took place in a bureau employing 172 stenos and typists. Scrutinizing the work itself could probably have saved even more.

The rising bureaucrat who mounts the throne of paper work is what has been called "an empire builder." The routing sheet — the "buck sheet" — is his scepter, the all-encompassing interoffice memo his coronet.

For subjects he employs squads of administrative assistants, platoons of secretaries, and a whole corps of file clerks. Safe from all but the most observant methods analyst, he wages war for preferred place in the next higher row of rectangles on an organization chart.

Unfortunately, top management often accords him the place he craves. After all, anyone responsible for supervising that many people must surely deserve a more impressive title, even more typists, and naturally some consideration when the checks are passed out on Friday.

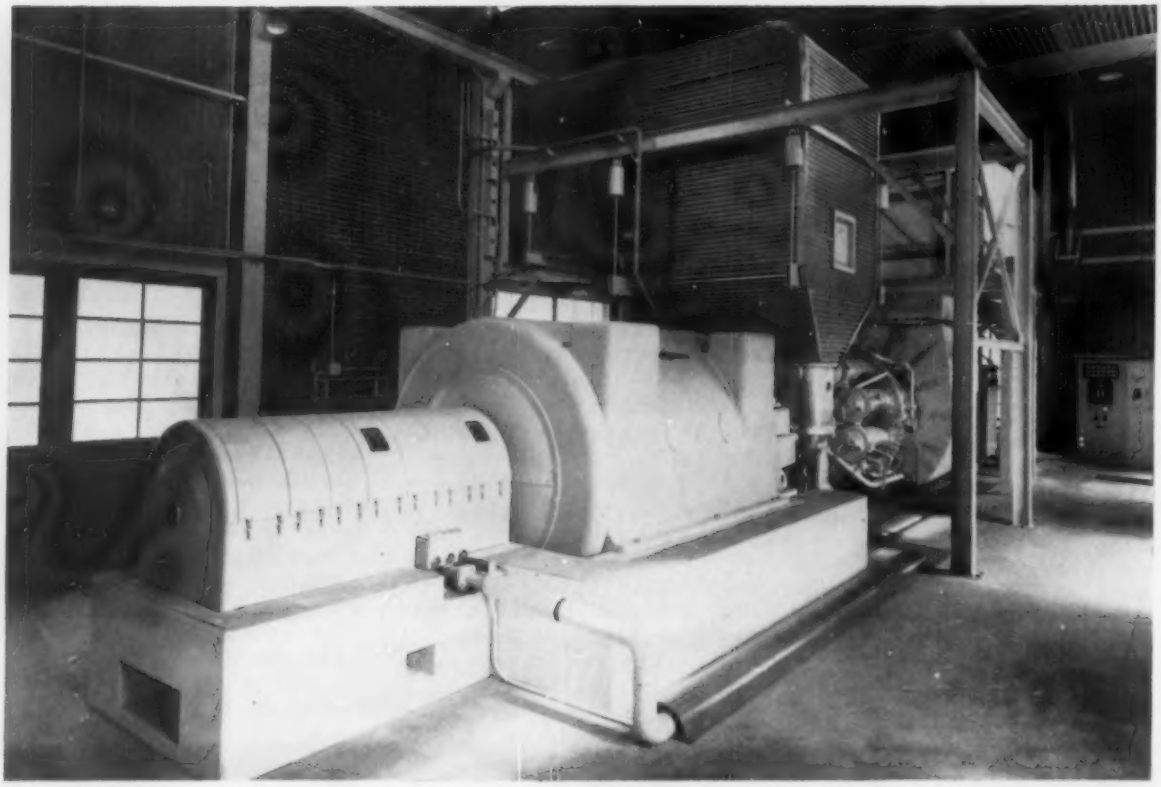
The empire-builder always keeps his people busy; in fact, his working force appears to be short-handed.

Of course, those who run the paper mills in industry and government can always defend a given operation by pointing out that each suspicious operation completes a minor but esential part of the total picture. Suppose it does cost a certain aircraft assembly plant approximately $25 to process an order for $0.15 worth of gummed silver stars to put on certificates awarded to outstanding trainees.

Suppose the Kee Lox Manufacturing Company did estimate a few years back that the average business letter costs 72 cents in time, overhead, and materials. Suppose, as the General Services Administration estimated, the Federal Government writes four million letters per working day — 116 letters per heartbeat. Are not these just little items in the overall problem, tiny pieces in a huge jig-saw puzzle?

Well, yes, they are. But unfortunately, the paper work often gets out of control. And perhaps it is fortunate for small business that paperwork begets paper work, that big forms get married and have little forms. Perhaps small industry is lucky that (as a leading manufacturer of duplicating equipment estimates) 6577 paper forms are needed to turn a pine tree into another paper form; and that a circular letter sent to 3000 field representatives of a major California oil company took 18,000 minutes of company time (the oil company estimated) to read.

Perhaps, indeed, the dedicated pencil pushers are built-in corrective devices. Perhaps were it not for the burden of paper work large industry would pre-empt every activity now saved for small industry.



MONROE, LOUISIANA — This big gas turbine offers the advantage of quick starting and ease of installation.

New Gas Turbine Generating Unit

Monroe, Louisiana installed gas turbine to meet fast growing air conditioning demands. Efficiency will go up 10% when combined with steam unit.

By GEORGE O. PHILLIPS
Vice President
Ford, Bacon & Davis, Inc.

RAPID EXPANSION of the air conditioning load since 1950 has of course had tremendous impact upon the utilities of the South. Their peaks already occurred during the summer and the new load naturally coincided with, and added heavily to, their maximum requirements. The City of Monroe, Louisiana, has shared this experience rather fully. Through the foresight of their Utility Commission, this municipal utility has managed to maintain a lead on the system demand.

Between 1950 and 1955, 22,500 kw of new capacity was installed in three equal units. This effectively tripled the previous system capacity in a span of only six years. Despite this rapid expansion, daily peaks were breaking into reserve capacity by early summer of 1957. The Commission felt that another year of growth would eliminate the reserve — a suspicion which was supported by our engineering study and later confirmed by experience.

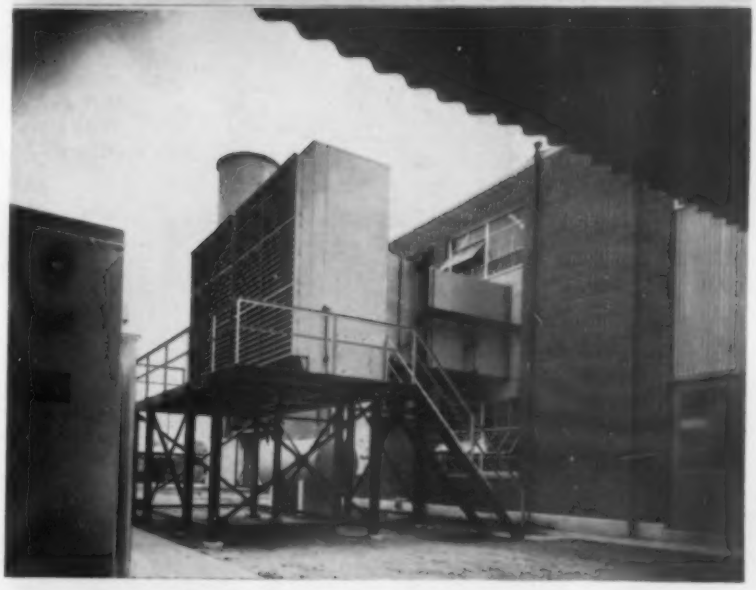
The immediate problem was to provide new capacity in something less than a year. The long range view required that the new capacity fit eventually into a high-efficiency, dependable overall development.

As indicated by our initial studies, a gas turbine generator proved the complete answer to the immediate need, and a logical initial step toward the ultimate objective. It could be installed in the time available. Its inherent characteristics, plus the integral control features incorporated in its design, fitted it ideally for peak service. Daily starting and stop-

UPPER — Gas compressor interstage coolers and yard piping.

CENTER — 13 kv switchgear for new gas turbine generator.

LOWER — Air filter for gas turbine generator.



ping is a matter of no particular concern with this type of equipment, and in addition it can be started very quickly in a situation of impending emergency.

The installation, designed and supervised by Ford, Bacon & Davis, Inc., was completed during June, 1958, allowing a few weeks for trial runs. It went into commercial operation over the Fourth of July weekend and operated almost daily except for weekends throughout the summer months.

Operation has been completely trouble-free. Although it has been in service less than a year, it has already demonstrated its value in its second function of emergency starting. On that occasion, the unit actually logged a 13-minute start.

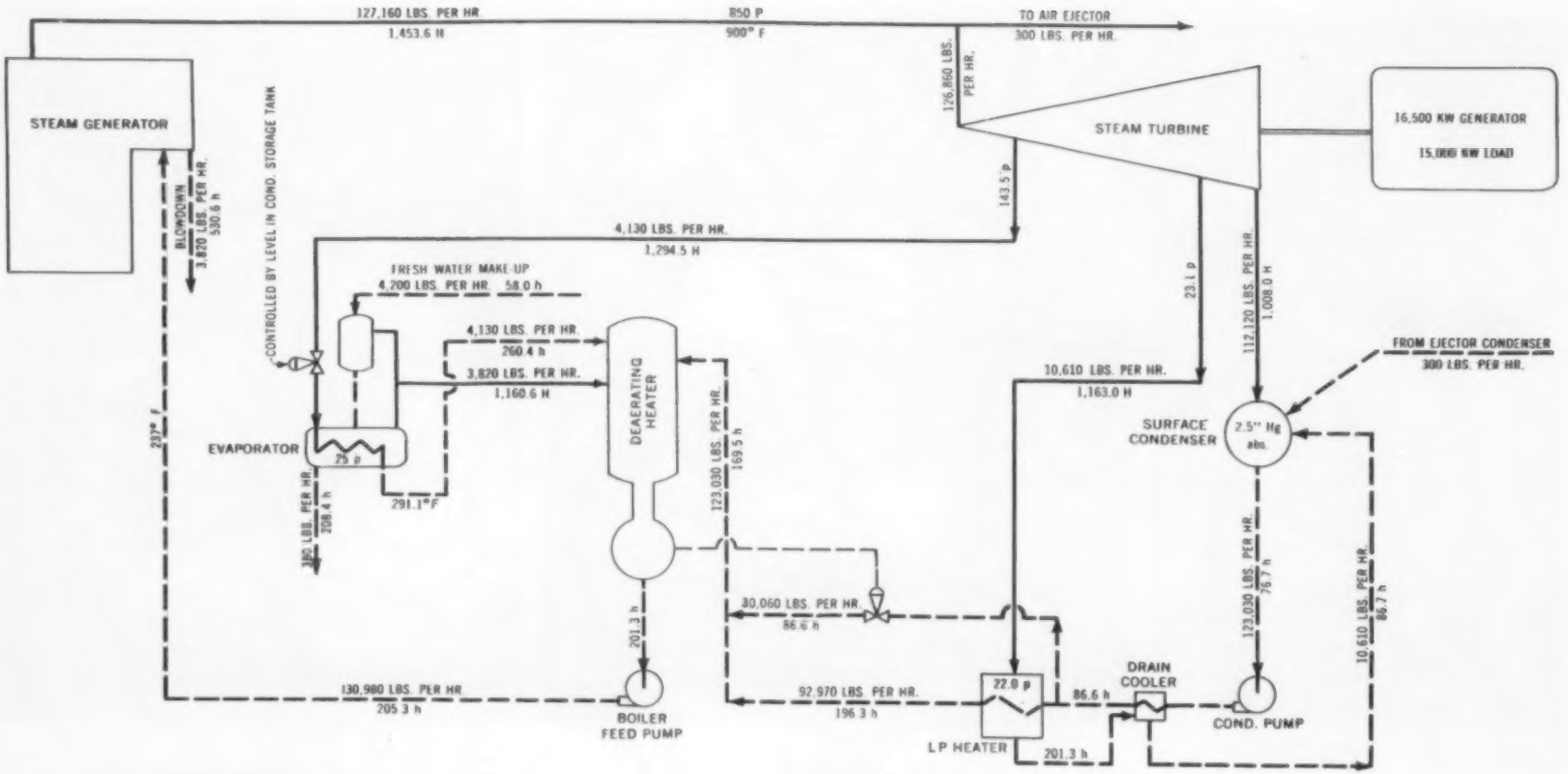
Gas Turbine Unit

General Electric Company supplied the unit, which consists of a 10,000 kw gas turbine drive and a 12,500 kva generator. Since system power factor is about 88 per cent during peak intervals, full-capability operation is possible.

The fuel is natural gas, which is also the fuel for the steam installation. Two motor driven gas compressors have been provided and when these are operated together they can supply 130 per cent of the full load fuel requirement of the turbine at a minimum guaranteed pressure in the supply main.

Since 65 per cent of the full load fuel demand is required at half load of the turbine, one of these compressors can be out of service and generating capacity is only reduced by half.

This and other similar provisions which were installed at moderate extra cost over bare minimum requirements give reasonable assurance that, short of a failure in the main unit itself, capacity will not be reduced by more than 5,000 kw



GROSS GENERATION

4,130 LBS PER HR (159.1 BTU PER LB)	=	657,100 BTU PER HR
10,610 LBS PER HR (290.6 BTU PER LB)	=	3,083,300 BTU PER HR
112,120 LBS PER HR (445.6 BTU PER LB)	=	49,960,700 BTU PER HR
TOTAL USED ENERGY	=	53,701,100 BTU PER HR
INTERNAL LOSSES (4.67%)	=	2,507,800 BTU PER HR
GROSS GENERATION	=	51,193,300 BTU PER HR
	=	15,000 KW

HEAT RATES

STEAM UNIT OPERATING ALONE = $\frac{201,900 \times 1025}{15,000}$ = 13,796 BTU PER KWHR

COMBINED OPERATION OF GAS TURBINE & STEAM UNIT = $\frac{279,000 \times 1025}{9215 + 15,000}$ = 11,810 BTU PER KWHR

BOILER

HEAT OUTPUT = 127,160 LBS PER HR (1248.3 BTU PER LB) + 3820 LBS PER HR (325.3 BTU PER LB)

= 159,977,000 BTU PER HR

WASTE HEAT RECOVERY 56,300,000 BTU PER HR

HEAT FROM COMBUSTION 103,677,000 BTU PER HR

FUEL CONSUMPTION

WITHOUT RECOVERY = $\frac{159,977,000}{1025 \times 1000 \times .773}$ = 201.9 MCF PER HR

WITH RECOVERY

BY GAS TURBINE (AT 9215 KW LOAD) = 160.0 MCF PER HR

BY BOILER = $\frac{103,677,000}{1025 \times 1000 \times .850}$ = 119.0 MCF PER HR

TOTAL 279.0 MCF PER HR

City of Monroe Utilities Commission
Monroe, Louisiana

16,500 KW
STEAM TURBINE INSTALLATION

HEAT BALANCE
POWER PLANT EXTENSION

under any of the more likely trouble conditions. So much for the immediate problem of providing peak capacity.

Long Range Plan

The ultimate objective of fitting this new installation economically into a long range plan for high-efficiency operation required incorporation of some special provisions in our original design.

It is well known that extremely good joint efficiency is obtainable when superimposing on a steam cycle if the gas turbine exhaust is used for combustion air and economizer heat recovery.

With this in view, the exhaust duct was made much longer than would have been required for the gas turbine in independent operation. It was laid out to permit future connections to the eventual steam boiler which, incidentally, will re-use the stack provided for the gas turbine. Space was provided for the installation of dampers to permit either joint or independent operation of one or both units.

When the steam unit goes into service, the two in joint operation will achieve an overall efficiency about 10 per cent better than that which might be expected from two steam turbine units of about the same total capacity. This combination will be by far the most efficient equipment in the station, and at that time it will be base loaded. Since the gas compressors will require periodic dismantling, provision has been made for installation of a third compressor for base load operation.

Naturally, in order to make these preliminary provisions, it was necessary for us to develop the planning of the future steam unit well in advance of its procurement. A 16,500 kw preferred standard turbine generator is proposed, subject, of course, to any later revision of capacity which may be indicated by load trend. The boiler will be of 175,000 lb per hour capacity, substantially larger than would normally be required for the new unit.

Because of its heat recovery connection, the new steam generator will be substantially more economical than the existing units. The excess capacity will be used through a pressure reducer-desuperheater as part of the supply to the existing units, with a resultant net fuel saving.

Fuel gas compressors.

This excess capacity will permit the shutdown and eventual removal of an old low pressure boiler which furnishes some of the steam to two small units, one of 2,500 kw and the other of 3,500 kw capacity.

The new steam unit installation will be much simplified, as compared with normal practice in independent units, to take full advantage of possible heat recovery by the economizer. Since air preheaters have no application in such joint operation installations, the limit of heat recovery is established by feedwater temperature entering the economizer. Regenerative feedwater heating to high temperature is not economic under this circumstance; it merely increases stack loss, so such heating has been minimized in our design.

Flow Diagram

As illustrated in our heat balance diagram, only two of the four bleed steam connections available will be employed. The high pressure bleed will supply an evaporator only; a secondary supply (not shown on the balance) will be provided through a pressure reducer from the steam main to permit independent evaporator control at low loadings. The evaporator output and drains will normally be adequate to supply the deaerator, so that no bleed steam connection is provided for this purpose.

The deaerator likewise has a secondary source of pressure reduced steam in order to maintain its pressure at a minimum of 5 psig. The only closed heater in the cycle will obtain its steam from No. 3 bleed point. This heater will be partially bypassed on the water side by an automatically controlled valve impulsed by the water temperature in the deaerator storage tank. Water temperature leaving the deaerator will thus be stabilized in a narrow range — 228 F when the deaerator is operating pegged at 5 psig and to 233 F in normal operation. Stack temperature will be about 380 to 385 F.

It is possible that the closed heater function will be replaced by a stack water heater, provided experience with the early installations of this type of equipment prove satisfactory.

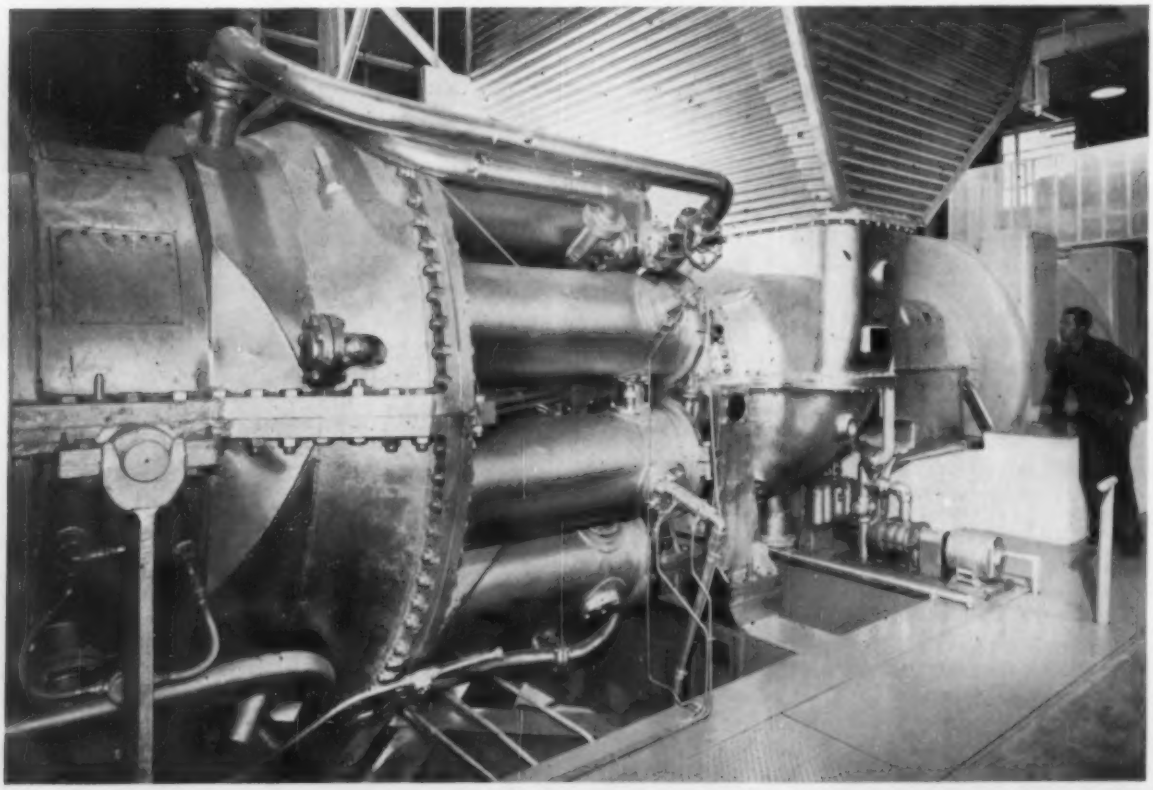
Compared to a normal four-heater cycle, this simplification achieves substantially better efficiency during joint operation, and a considerable saving in first cost. It sacrifices a degree of efficiency during periods of independent operation of the steam unit alone, but in the overall view this is of little consequences.

At about 90 per cent load on the two units, the combined fuel rate will be about 11,800 Btu/kwh based on high heating value, or 10,700 Btu/kwh based on low heating value of the gas.

Both the new structure housing the gas turbine, and the older structure which houses the present steam units are appropriate to the residential area in which the plant

The new 10,000 kw gas turbine is housed in this new building. Air intake is at the side of the building, and the exhaust stack is at left.

The gas turbine was available a year sooner than equipment for a steam turbine station could be obtained and expedited installation of capacity to meet summer air conditioning demand.



PRINCIPAL EQUIPMENT
GAS TURBINE — MONROE, LA.

Expansion Joints ..... Croll Reynolds Engr. Co., Inc.

Overhead Crane ..... Shaw Box Div., Manning, Maxwell & Moore
11 ton capacity, hand operated.

Exhaust Stack ..... Birmingham Iron Works

Duct Work ..... Mosher Steel Co., of La., Inc.

Air Filters ..... Continental Air Filters, Inc.
15'0" high x 20'11" wide x 7'1½" deep, automatic self-cleaning, 137,120 cfm.

Gas Compressors (2) ..... Oilwell Supply Company
Model DGM-300 Duplex, suction pressure 15 to 40 psig, discharge pressure 180 psig, 87,500 scfh each. Explosion proof motor — 300 hp.

Compressor Building ..... Allied Steel Products Corp.

Gas Turbine Generator ..... General Electric Co.
10,000 kw, 13.8 kv, 17,000 Btu per kw/hr.

Reactors (3) ..... General Electric Co.
3 each 600 Amp Dry Type, Indoor, Single phase, 0.5 ohm, 15 kv.

Bus Duct ..... Westinghouse Electric Corp.
1,200 Amp, 15 kv, 3 phase, Indoor Type, Metal Enclosed.

Switchgear ..... General Electric Company

is located. Noise has been effectively controlled in both intake and stack connections.

The total cost of the gas turbine generator installation, including site preparation, building and accessory equipment, was $1,748,000. The original estimate of approximately $2,000,000 was thus bettered by 12.5 per cent due principally to a favorable equipment market.

Other Improvements

A report on this project would not be complete without describing a small but important activity which was also undertaken at the same time. When design work started on the gas turbine installation, a study was initiated to improve operation of the existing steam equipment.

Still in progress and nearing completion, this study had three objectives — improved dependability, better fuel economy and lower station power consumption for auxiliary drive. Results so far have been extremely favorable.

Installation of an additional water-circulating pump and valving, has reduced the reserve capacity requirement for all emergencies, except unit failure, from 7,500 kw to 6,000 kw, with resultant improvement in system dependability.

Fuel consumption per gross kilowatt-hours produced has been cut by over 5 per cent. Auxiliary power consumption has been progressively reduced. In the first non-peak month of operation since the program has been in substantial effect, it was down 18 per cent from the same month of the preceding year.

These important gains have been effected largely through the work of Lawrence L. Nunley, operating superintendent, and his staff, with the cooperation of our engineers when required. The necessary financial and administrative support for the project was given by the Utility Commission, headed by French Smith.

Abrasive Material Handled

SODA ASH is delivered by the bulk carrier truck to the subfloor receiving hopper of the conveyor and carried thirty-six feet vertically and twenty-two feet horizontally to the pug mill on top of the sodium carbonate storage tank at the Phillips Petroleum Co., Ambrosia Lake, plant.

The conveyor has a sealed pin chain to permit handling abrasive materials with minimum wear. The unit is watertight, dustproof, pressure and vacuum tight, self-feeding, self-cleaning, basically self-supporting and space saving.

The Hapman Tubular Conveyor is the series No. 78, 8" diameter unit with cast iron flights. It travels at a rate of sixty-five feet per minute, and carries approximately twenty tons of soda ash per hour.

You Can Have D-C

(*Continued from P. 39*)

simplicity of d-c speed adjustment, made by the simple turn of a knob, again made the d-c adjustable speed drive a logical choice.

On a machine producing a variety of products, the speed must be adjustable to obtain maximum output for whatever product is made. Since this speed may vary considerably for a given machine, the speed of the drive must be easily and quickly adjusted to obtain maximum output and minimum downtime.

In addition, the process may have to be started or threaded at a low speed and later accelerated to a preset running speed after the machine is operating satisfactorily. These again are functions easily provided by a d-c drive.

In automation, devices measuring tension, position, temperature, moisture content, stretch, consistency, thickness, or many other properties may be used to control the process. Signals from any of these sensing devices can be used to control a d-c drive to obtain maximum, high quality, machine output.

Drive Application

D-c drive applications are found in practically all industries and include the paper machine drive where speed of several elements must be accurately regulated. Other paper industry drives include winders, laminators, waxers, roll winding, washers, deckers, embossers, coaters and several others.

In the rubber and plastics industry, d-c drives are used on extruders to vary the speed with the size of the extrusion, on calenders and on calender auxiliaries to provide an adjustable speed difference between the calender and the sections that follow.

In the cement industry, d-c drives are used to control the speed of the kiln or to operate a kiln feeder so it will follow the speed of the kiln and maintain constant input to the kiln.

In the woodworking industry, rapidly reversing drives are used to carry the log into the saw, stop, reverse, stop and again accelerate the log into the saw. This industry also uses d-c to control the speed at which the boards are fed into planers or other saws; to maintain an approximately constant cutting speed on a veneer lathe as the diameter of the log gradually decreases and to control the feeding and barking of logs.

In steel mill applications, large reversing mills are used to roll the steel into plates, to draw rods, to make pipe, to make tinplate and for many other processes.

The machine tool industry uses d-c drives to provide a constant cutting speed as diameter of the cut decreases.

Many additional d-c applications could be listed for the printing, test stand, textile, mining, material handling, non-ferrous, shipping, and many other industries.

From 1940 to 1955, General Electric's production of d-c motors and allied equipment was twice that of its entire previous history before 1940. Because of the future need for greater production with less man-hours, it is expected that this growth will increase. In the period 1947 to 1954, the purchase of d-c motors 1 to 200 hp increased by 85%. The purchase of all types of motors in this range increased by only 20%.

Proper Care of V-Belt Drives

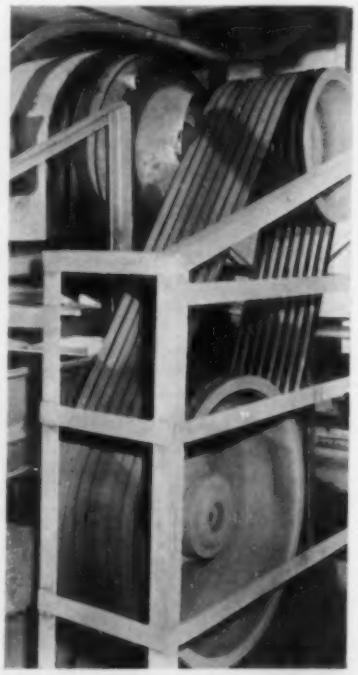
PROPERLY engineered V-belt drives provide one of the most efficient and economical means of power transmission in many industries. However, attention to various factors are necessary to prolong belt lives and assure continuous production.

Improper sheave alignment is one of the most common causes of excessive wear. Things to look for here are: (1) sheave grooves more highly polished on one side than on the other; (2) belts worn more on one side than on the other; (3) continuous squeaking or overheating of bearings Alignment can be readily checked by placing a straight-edge or cord across the rim faces of the driver and driven sheaves.

Over-tension on belts causes excessive bearing pressure. A loose belt can result in slip burn, snub breaks, and ruptured cords in the grommet or plies.

Proper tension is not difficult to determine. Simply apply moderate pressure to belt midway between sheaves. A belt that can be depressed an amount equal to its own thickness for each 48-in. of unsupported length is considered properly tensioned.

Sheaves should be inspected regularly for burrs, rough spots, or excessive groove wear. Grooves kept free of dust or foreign matter will prevent side wall wear. Oil is another hazard to belt life. When exposure to it cannot be prevented, it's good economy to install oil-resisting belts.



Remove all tension from belts connected to machines which will be idle for extended periods. They retain their usefulness best if stored in a cool, clean, dry area, placed in bins, or hung over wall pegs. Sharp bends which could result in a permanent "set" are to be avoided. Tying matched sets of belts together will avoid mismatching.

Courtesy, Allis-Chalmers

any way you look at it...

YARWAY REMOTE LIQUID LEVEL INDICATOR GIVES BRIGHT, INSTANT, ACCURATE READINGS

On its brilliant "wide vision" dial you can clearly read the level from any point in a 180° arc—and from a considerable distance.

Remote readings of levels in boilers, feed water heaters and other heat exchangers are instant and accurate because indicator operating mechanism is actuated by the varying head of the liquid itself, yet the pointer mechanism is never under pressure.

Yarway Indicators may be arranged to operate remote Yarway Electronic Secondary Indicators or remote Hi-Lo Alarm Signals (lights or horns) located anywhere in the plant.

A record of nearly 13,000 successful installations speaks for itself.

For details on construction, operation, installation and typical hook-ups, write for Yarway Bulletin RI-1825.

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YARWAY
A MARK OF QUALITY IN STEAM ENGINEERING

Centrifugal Pump Clinic

QUESTION & ANSWERS — Conducted for SPI readers by **Igor J. Karassik**, consulting engineer and Manager of Planning; and **W. C. Krutzsch**, assistant chief engineer of the Harrison Division, Worthington Corporation.

Question . . .

WE WILL shortly be running an acceptance test on a new pump and in attempting to set up the instrumentation for this test have raised some questions on which there seems to be some difference of opinion among various people in our own organization. We would appreciate any comments you would be willing to offer on the following points:

1) In establishing suction lift, is it necessary to add velocity head to the gauge reading to determine the actual lift?

2) If this pump were operating with head on suction instead of with a suction lift, what effect would this have on the answer to the preceding question?

Answer . . .

THAT A CERTAIN degree of confusion is likely to exist in connection with the question you have asked is adequately demonstrated by the frequency with which it recurs.

This confusion undoubtedly is caused largely from the natural and accepted practice of using atmospheric pressure as the reference point for other pressure measurements. Thus, with pressures above atmospheric, we deal always with positive values and no confusion arises, since our thinking proceeds along the lines of straightforward arithmetical addition and subtraction.

In dealing with presures below atmospheric, however, we are confronted with negative values and must resort to algebraic addition and subtraction. While this is undeniably elementary, the transformation of the physical concepts into mathematical quantities seems to introduce just enough complication to confuse the issue.

This being the case, the obvious solution would be to use only absolute pressures. This is a useful concept and if it helps in keeping things straight there is no objection to its use. It is not customary, however, and since it is by no means essential, the following may serve to clarify the problem.

In discussing suction lift (or suction head), it is useful to keep in mind the basic purpose of any pump in any system, which is simply to add energy to the fluid stream. Thus, the work done by the pump is represented by the increase in the energy of the fluid stream as it passes through the pump or, in other words, by subtracting its energy at the inlet from its energy at the outlet.

These measurements of energy, when applied to a unit of mass of the fluid, are referred to as measurements of "head," expressed in feet of the liquid pumped. Thus, the "total head" of a pump is simply the difference between the "total discharge head" and the "total suction head." If all pressure measurements are expressed as absolute values, these two terms are always positive and total head is determined by simple subtraction.

When pressures are expressed in gauge values, however, the total suction head is frequently negative. Under these circumstances, we must be careful to subtract algebraically in order to determine total head, as follows:

$$H = H_d - (-H_s) \qquad \text{(Equ. 1)}$$

where H is total head and the subscripts (d) and (s) refer to discharge and suction, respectively. Numerically, of course, this is equivalent to

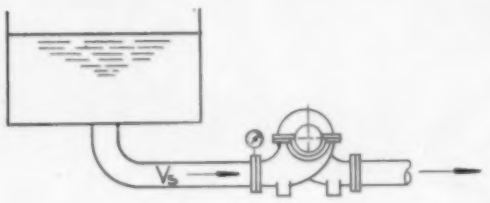
$$H = H_d + H_s \qquad \text{(Equ. 2)}$$

Thus, in effect, the total suction lift (negative suction head) is added to the total discharge head to obtain total head.

From the foregoing, it should be evident that suction head and suction lift are treated in exactly the same fashion, but that in dealing with a lift we must be careful to observe correct usage of the algebraic sign conventions. Having established this, we are faced now with only one remaining necessity, which is to examine the individual components of *any* head measurement.

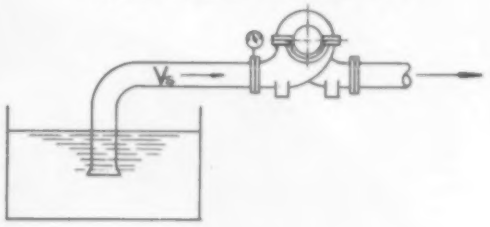
These components are simply the three forms of energy which were represented by Bernouilli in his

FIG. 1 - TOTAL SUCTION HEAD



GAGE READING (CORRECTED TO PUMP CENTERLINE) = Hsp
$\frac{V_s^2}{2g}$ (AT POINT OF GAGE ATTACHMENT) = Hsv
TOTAL SUCTION HEAD Hs = Hsp + Hsv

FIG. 2 - TOTAL SUCTION LIFT



GAGE READING (CORRECTED TO PUMP CENTERLINE) = Sp
$\frac{V_s^2}{2g}$ (AT POINT OF GAGE ATTACHMENT) = Hsv
TOTAL SUCTION LIFT S = Sp - Hsv

well known equation as potential energy, pressure energy and velocity energy. In pump test work, the first of these is accounted for by referring all head measurements to a common elevation. Pressure energy is measured by means of a bourdon gauge, mercury manometer or some other form of pressure sensing device. Velocity energy is usually obtained by calculation.

Since gauges will generally remain in fixed positions during any test, the gauge elevation corrections (potential energy) may be worked out in advance and will remain constant for all readings. Pressure and velocity energy, on the other hand, will vary with capacity. Thus, for each test point, our head readings must include both terms. In the case of suction head,

$$H_s = H_{sp} + H_{sv} \qquad \text{(Equ. 3)}$$

where the subscripts (p) and (v) refer to pressure and velocity, respectively. (See also Fig. 1)

In the case of a suction lift, we have a negative suction head, but since the velocity head component must always be positive, this expression becomes:

$$-H_s = -H_{sp} + H_{sv} \qquad \text{(Equ. 4)}$$

This equation simply indicates that the suction gauge reading shows a negative head which is lower than the true (or total) negative suction head by the amount of the velocity head. However, in reading a suction gauge, or in speaking of suction lift, we are referring to a measurement below atmospheric, and hence the gauge indication must show a higher numerical value to denote this lower absolute value. (See also Fig. 2.) Thus, if we were to indicate suction lift as (S), we would in effect be multiplying Equation 4 by (−1) and it becomes:

$$S = S_p - H_{sv} \qquad \text{(Equ. 5)}$$

The answer to your first question, therefore, since it is expressed in terms of suction lift, must be that it is necessary to subtract the velocity head, rather than add it, to obtain the actual total suction lift of the pump. Expressed in other words, the total suction lift is lower, numerically, than the gauge reading since the fluid contains some energy in the form of velocity head which does not show on the gauge.

In the case of suction head, it should be evident from the preceding discussion that the velocity head must be added to obtain the actual total suction head. This is no different from the case of suction lift, except that in the former instance we gave cognizance to the fact that we were measuring a negative quantity.

To summarize the effect of these two situations on pump total head measurements, we may say that where we refer to suction lift, our total head is equal to the total discharge head plus the total suction lift:

$$H = H_s + S, \text{ or}$$
$$H = H_{sp} + H_{sv} + S_p - H_{sv} \qquad \text{(Equ. 6)}$$

Where we speak of suction head, be it negative or positive relative to atmosphere, our total head is equal to the total discharge head minus the total suction head. For positive suction head,

$$H = H_d - H_s$$
$$H = (H_{dp} + H_{dv}) - (H_{sp} + H_{sv})$$
$$H = H_{dp} + H_{dv} - H_{sp} - H_{sv} \qquad \text{(Equ. 7)}$$

For negative suction head,

$$H = (H_{dp} + H_{dv}) - (-H_{sp} + H_{sv})$$
$$H = H_{dp} + H_{dv} + H_{sp} - H_{sv} \qquad \text{(Equ. 8)}$$

Note that, numerically, Equation 8 will produce the same result as Equation 6, which of course is as it should be.

We might suggest that prior to running the acceptance test, you refer to the Standards of the Hydraulic Institute, Section VIII, Test Code (1955 Edition) which will give you considerable information on various phases of centrifugal pump testing.

Cleaning Hand Plates

WE WERE having some trouble cleaning hand plates on our three Springfield Boilers. It was costing us 16 man-hours to clean 77 hand plates on one boiler. We were using graphite and oil or plain graphite coated asbestos gaskets.

We changed to Q Seal and the same job was completed in 2 hours. Q Seal can be thinned with water and applied with a small paint brush. It is manufactured by Quigley Co. Inc.

By By C. M. KELLEY, Plant Engineer, Missouri Public Service Co., Sedalia, Missouri.

GENERAL CONTRACTORS: Campbell Construction Co., Detroit, Mich.
ARCHITECT & ENGINEERS: Campbell Engineering Co., Detroit, Mich.
ELECTRICAL CONTRACTOR: Southeastern Electric Co., Detroit, Mich.

Electrical Protection goes MODERN *with* BUSS Fuses

in the Hoover Tool & Die Co., Centerline, Mich.

This new industrial plant on the outskirts of Detroit illustrates that the modern trend in electrical protection is to fuses. The main switch gear is a 1600 ampere pressure switch protected by BUSS Hi-Cap fuses. The distribution panels, both power and light, are equipped with FUSETRON dual-element fuses.

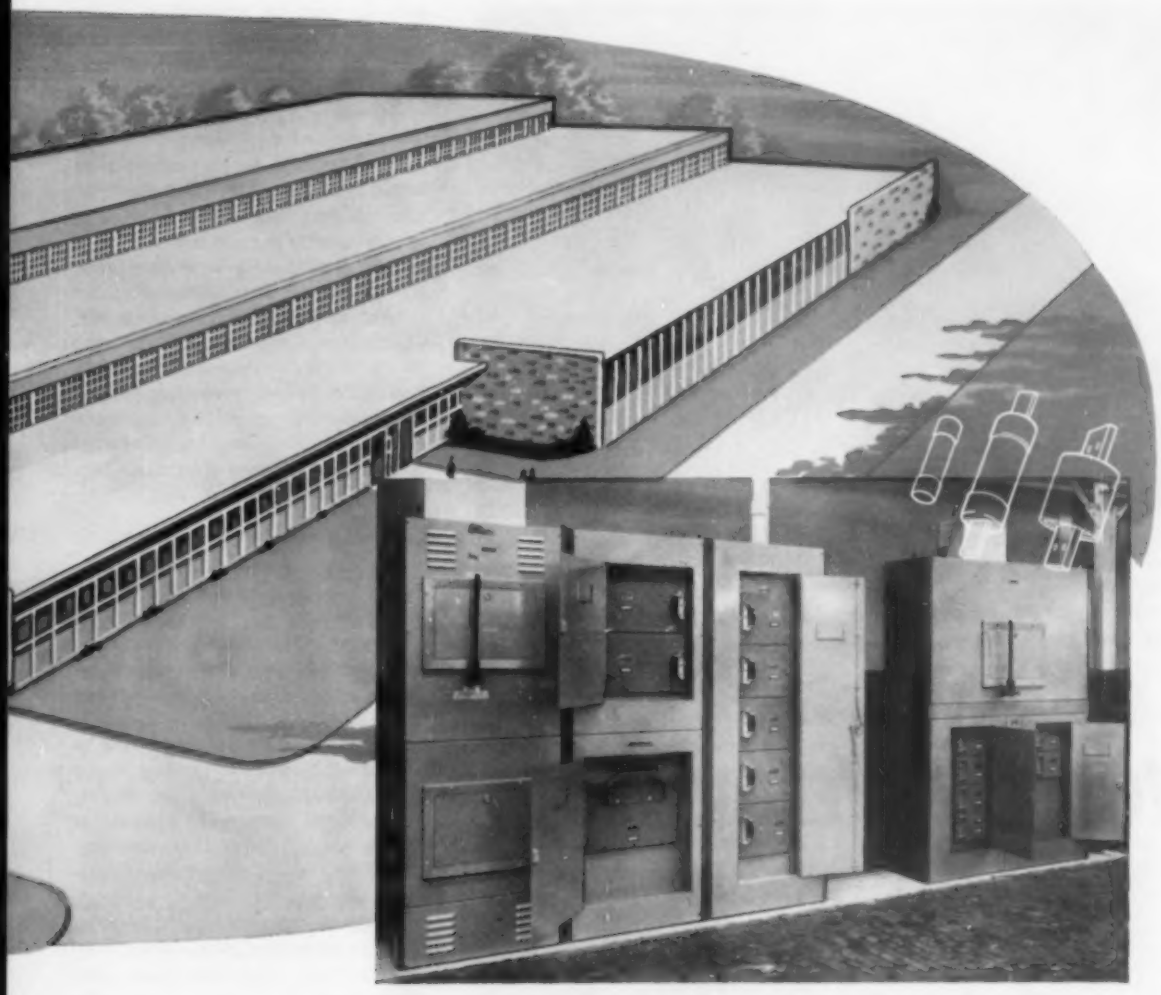
This plant will have many operating advantages because fuses are installed. *For instance:*

Future expansion without sacrificing safe protection.

Provisions were made to install a second 1600 ampere pressure switch when needed. This additional capacity and any increase in available fault current can safely be handled by BUSS Hi-Cap and FUSETRON dual-element fuses.

The interrupting rating of BUSS Hi-Cap fuses is 200,000 amperes rms symmetrical — and for FUSETRON fuses it is 100,000 rms symmetrical.

ANOTHER BUSS HI-CAP AND FUSETRON FUSE INSTALLATION



Main Power Panels —
BUSS Hi-Cap and FUSETRON Fuses

Through the year's savings result from the greater dependability of fuses.

Unlike mechanically operated devices, a fuse has no hinges, pivots or contacts to stick or get out of order. Dust, fumes, corrosion or age cannot increase a fuse's capacity or lengthen its blowing time.

After years of service, a fuse will give the same safe, dependable protection if called upon to open as it would have given on the day it was installed.

The dependability of BUSS Hi-Cap and FUSETRON fuses helps to reduce costs — by preventing damage and loss due to electrical faults — by being maintenance free — by requiring no periodic inspections — and by eliminating shutdowns caused by needless outages.

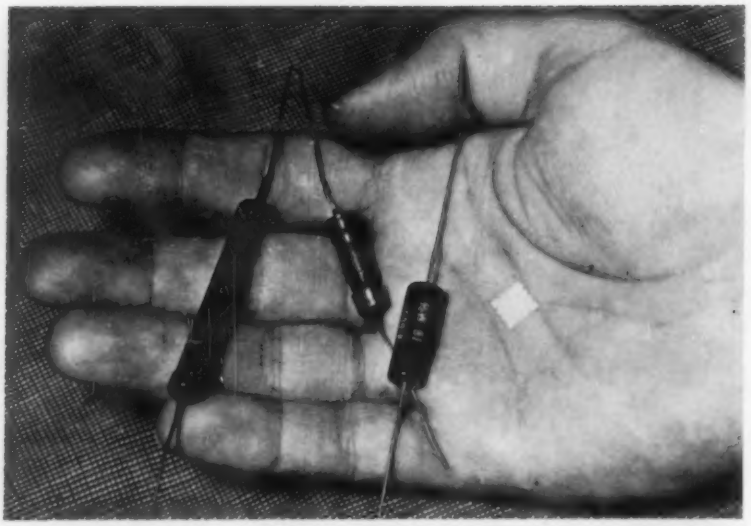
Is it any wonder then that "ELECTRICAL PROTECTION IS GOING MODERN WITH FUSES"? No other type of protective device can match the combined high-interrupting capacity, dependability and maintenance-free features of fuses.

For more information

On BUSS Hi-Cap fuses . . . . *Write for bulletin HCS*

On FUSETRON dual-element fuses . . . . *Write for bulletin FIS*

BUSSMANN MFG. DIVISION, McGraw-Edison Co. ST. LOUIS 7, MO.



Comparison between micro-element resistor (the tiny square object at right) and three resistors in use today. Developers of the micro-miniature resistors believe electronic equipment and systems can be made ten times smaller and lighter through use of micro-element design.

ATOMIC DEVELOPMENTS

By JOHN F. LEE
SPI Consultant on Atomics
Broughton Professor and
Head of Mechanical Engineering Dept.
North Carolina State College

A NEW ATOMIC check system which enables rapid, accurate identification of railroad cars, trucks and other vehicles in freight yards, depots and similar areas of heavy traffic (a joint development of United States Radium Corporation, Morristown, N. J. and Electronic Associates, Ltd., Willowdale, Ontario) has been announced.

The system employs varying patterns of small radioactive sources which are affixed to an external surface of a vehicle or group of vehicles. As a vehicle passes the detection point, the "pattern" of the sources is picked up by sensors and passed to a special amplification and decoding system, then to a read-out device such as an illuminated indicator, tape printer, card punch, etc.

Information can be readily converted to a form suitable for transmission over telegraph or telephone wire, radio links, etc., for remote reading. This system can be used to identify railroad cars traveling at low speeds as well as speeds in excess of 100 miles an hour.

Sources are either permanently attached or mounted on a mechanical assembly which can be removed when desired. Advantage of this latter option is that the source pattern can be modified to alter the "number" on a vehicle, i.e., if the number of a locomotive is to be changed from 47 to 42, the pattern is easily revised to reflect the new designation.

One of the features of the system is that it enables a large number of vehicles to be identified by an arrangement of relatively few sources as in the case of thousands of separate railway cars operated by a single railroad. Yet the system is so flexible that it can be adapted to designation of a few different codes for identification of specific railroads.

The system requires no power from the vehicle, consequently no wiring or periodic maintenance. Operation is independent of light or darkness, temperature or rain with extreme resistance to physical elements such as build-up of snow or mud. Possible application to industrial processes & procedures will be interesting to engineers.

Industrial Uses of Isotopes

The U. S. Atomic Energy Commission, in cooperation with Georgia Institute of Technology and Lockheed Aircraft Corporation, sponsored a two-day symposium on Industrial Uses of Radioisotopes in Atlanta, Georgia.

The symposium was designed to provide information on the many industrial applications of radioisotopes and to increase awareness of the versatility of these nuclear tools and the industrial opportunities provided by them.

Industry representatives reviewed the economic implications of radioisotopes and discussed improvements in production and efficiency obtained by their use in gauging, radiography, and industrial tracing.

AEC representatives reviewed government programs of cooperation with industry and education in encouraging increased application of profitable radioisotope techniques.

A series of brief experience reports by industrial users in the pulp and paper, textile, aircraft, ceramic, food processing, petroleum, metalworking, general chemical, and other industries were included.

Report on Isotopes

A recent study states that when all uses are considered together, the petroleum industry reports the most benefit from applications of radioisotopes, followed closely by the chemical and allied products industry. Major benefits were also

reported in the tobacco, rubber, and paper and paper products industries.

Case examples reported include:

A paper company is saving over $193,000 annually through the use of beta gauges at an annual cost of slightly more than $10,000.

A manufacturer of pressure vessels, boilers, etc., is able to do its radiography work with artificial isotopes at an annual savings of $100,000 over what the work would cost with x-ray machines and radium.

A large petroleum company, through the use of catalyst circulation meters representing an annual cost of $2,400, produces $2 million more of gasoline annually with no increase in production costs.

In testimony before the Joint Congressional Committee on Atomic Energy, George B. Foster, Vice President and Technical Director, Industrial Nucleonics Corporation, surveyed the field of nucleonic gauging and reported, in part:

"In basic industries (steel, paper, rubber, etc.), installations of nucleonic measurement control systems may cost from $15,000 to $250,000 . . . With approximately 4,000 such systems now in operation throughout a broad spectrum of American industry, savings are estimated in the neighborhood of $300 million annually in raw materials alone."

Nuclear Boilers

A basic research program aimed at improving the design and efficiency of nuclear boilers and other pressure vessels is underway at Southwest Research Institute. The work is jointly sponsored by the Atomic Energy Commission and the Pressure Vessel Research Committe of the Welding Research Council.

Pressure vessels are weakest at their openings and it has been customary to overdesign them to provide a generous factor of safety since there is not enough basic information available to set minimum safety design requirements. This study is aimed at producing that knowledge.

Such information will be of great benefit since it will result in weight and cost reductions, especially in the nuclear boilers which are used to generate electric power. The program will have three lines of approach:

(1) Static analysis of the stress distribution around openings
(2) Changes due to initial cycling
(3) The determination of plastic fatigue for a variety of nozzle configurations.

This program of experimental stress analysis will utilize specially designed vessels made of three different steels — ASTM A-201; ASTM A-302; and U. S. Carriloy T-1. Plastic fatigue studies will be conducted at pressures up to 10,000 psi. The facility permits rise time, dwell time and fall time so the engineers will be able to program the complete pressure history.

Micro-element Resistor

A new molecular-structured resistor, ten times smaller and lighter than present resistance components, has been developed from the micro-module concept, the idea of combining extremely small elements of uniform shape and size into a single tiny module capable of performing complete circuit functions.

Basically, the micro-miniature resistors are a solid state material in the form of a ceramic wafer approximately 10 thousandths of an inch thick and 0.35-inch square. By processing suitable substrates, these micro-wafers are inscribed with a series of "isolation lines" which produce the resistor characteristics desired.

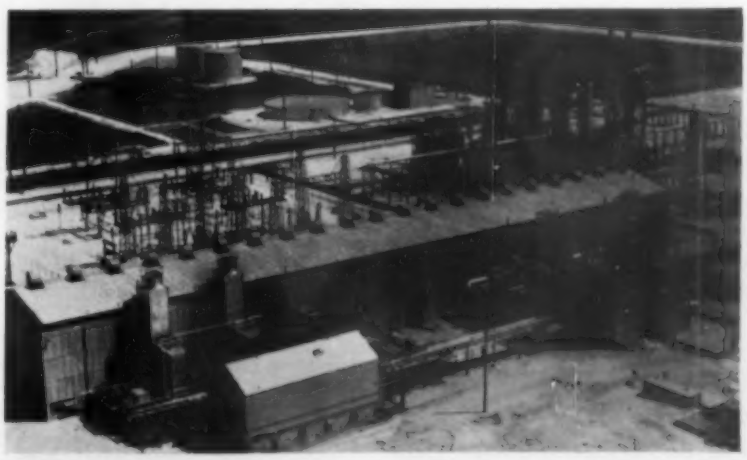
Single or double-sized resistor elements can be designed, and various combinations of circuitry can be employed with the basic micro-element. These wafer-like elements may then be combined into modules of standard size and shape comprising circuit sub-assemblies.

The ten-to-one size and weight reduction obtained with these micro-resistors opens new possibilities for design flexibility and economy in electronic equipment and systems, such as computers, satellites, missile guidance systems, and communications networks.

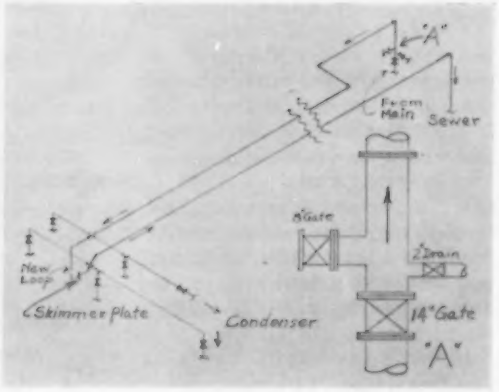
Each resistor element (weighing 50 milligrams) contains four resistors, averaging 10,000 elements (or 40,000 resistors) to the pound and a packing density of 600,000 parts per cubic foot.

Highly reliable and stable, the microscopic resistors are developed in wafer element forms designed for reliabilities of mean time to failure of 100,000 hours.

LIQUID HYDROGEN, identified by the Air Force as an "ultimate" chemical fuel with three times the energy content of present fuels, is in production at this facility in Palm Beach County, Florida. Built for the Air Force by **Air Products, Incorporated,** of Allentown, Pennsylvania, it is one of three plants in operation. Other facilities are located in Ohio and California.



Water Lines Cleaned Economically



By R. B. HAMILTON
Air Conditioning Engineer
Celanese Corporation of America
Rock Hill, South Carolina

CORROSION and fouling in water lines is nothing new, but an economical method of cleaning lines is so new that it is still being sought by many who have experienced the problem. Actually there are a number of ways to clean lines, but the battle between equipment shutdown and cost of cleaning versus results obtained continues to exist.

At the Celriver Plant of the Celanese Corporation of America at Rock Hill, South Carolina, the need for "something" became evident after five years of operation. During the summer when condenser water demand was at its peak, the refrigeration machines for air conditioning systems began to suffer.

Condenser head pressures were rising and capacity was dropping off. There just wasn't enough condenser water! Something had to be done — and fast. But what?

The alternatives, all undesirable, were: 1—install larger condenser water lines to the refrigeration machines; 2—install an additional water line to one machine while the existing line served the other two; 3—clean the existing 14" water line to provide greater flow.

Chemical Cleaning

The cheapest and most expedient solution was chosen — chemically clean the condenser water line.

Results were gratifying. The pressure drop in slightly over 200 feet of pipe was reduced from 14.5 lb per sq in. to 4.5 lb per sq in. Water flow was increased and the refrigeration machines were out of trouble. Shutdown time for the entire job was 30 hours.

Two years later the pressure drop in the line was back up to 13.5 lb per sq in. During those two years, the overall situation was studied, and it was felt that the water line could be altered to permit mechanical cleaning by passing a cleaner through the pipe.

Mechanical Cleaning

First a 14" loop was installed in the refrigeration equipment room to connect the end of the condenser water supply line to the beginning of the return line. A pair of flanges with a skimmer plate were installed in the loop to separate supply from return. Next an 8" neck was welded to the supply main just downstream from the main cutoff valve for the system. An 8" flanged gate valve was put on this neck. A 2" drain line and valve were also installed on this main.

A 14" rotary pipe crawler made by W. R. Chawner of Corona, California was purchased. It is actually an inflatable rubber ball enmeshed in a network of chains. It is placed in a pipe deflated. When properly positioned it is inflated with air or water or both, the access opening in the pipe is closed, and the main flow valve is opened to supply the impetus to move it along.

At Celriver the condenser water return line dumps into a manhole along with water for other equipment and all goes out one discharge opening. A few days before the cleaning was scheduled, a large mesh screen of heavy fence wire was constructed in the manhole to retain the crawler when it completed its trip and fell into the manhole.

When the day arrived everything moved smoothly (several dress rehearsals the previous week didn't hurt a bit). First the 14" main gate valve was closed and water drained through the 2" drain. Then the deflated pipe crawler was inserted through the opened 8" gate valve and inflated with compressed air. Meantime the skimmer plate in the new loop was removed to give a complete circuit.

As the main valve was opened to "Start the ball rolling" the strange sounds of the chains drag-

ging along inside the pipe could easily be heard. In about two minutes it was all over as the crawler fell into the manhole amidst a deluge of reddish-brown water and chunks of oxidation and tubercules.

While the crawler was being deflated with the aid of a small vacuum pump, the lines were drained again to make ready for another pass. During the 8 hour shutdown four passes were made — two with air in the crawler and two with part air and part water.

The entire operation was a complete success. Of primary importance is the fact that equipment outage was reduced to a total of 8 hours and cost of the job was less than one fifth that of chemical cleaning.

This cleaning procedure has been repeated since then with satisfactory results. It is expected that this water line will require cleaning about every three years, but the method devised has made it a routine job. Naturally this method is not suitable for every pipe cleaning job; but where it can be adapted, it is highly desirable.

By R. B. HAMILTON
Air Conditioning Engineer
Celanese Corp. of America
Rock Hill, South Carolina

Novel Power Scheme for Cranes and Locomotives

A NEW electrical system to supply power to gantry cranes or locomotives was announced in Baltimore recently at the Middle Eastern District Meeting of the American Institute of Electrical Engineers by W. J. Kutcher of the Square D Company, and William Boyd of the Aluminum Company of America. Their paper, presented at a power systems operation symposium, was titled Low Voltage Single Phase Power System for Transportation Equipment.

At Alcoa, they said, "a low voltage hot rail system of transportation was devised by I. D. Bohn which utilizes the rails on which the vehicle runs as the conductors of electric power. This scheme lends itself to many types of vehicles such as locomotives and gantry cranes."

Rail transportation in industrial plants offers definite economical advantages over rubber tired trackless vehicles for handling large quantities of materials they said.

Conventional electrically power rail units, and third rail installations were said to be impractical in plant areas.

In the Alcoa scheme, electricity is drawn from the rails at 60 volts, single phase. This is converted to three phase by a converter on the crane or locomotive. Three phase energy is used for the hoist and travel motors.

The track system is fed from the plant electrical distribution system through 460/60 volt stepdown transformers. The 60 volt current is considered entirely safe and about the same as a home electric train.

Keep heating costs low with HEV-E-OIL commercial-industrial burners

Hev-E-Oil burners furnish all the air necessary for combustion, assuring perfect fire control under all weather conditions. Low fire start that builds up gradually to the flame size required means smooth, safe operation. And once the burner is set for greatest efficiency, it *stays* that way no matter what the weather.

A complete package! Fire tested! Automatic, electronic controls. Meets all codes. Easy to install . . . Hev-E-Oil models from 5 to 150 gph. Also available, Hev-E-Duty power gas burners and combination gas/oil burners from 720,000 to 21,000,000 B.T.U.

For more information write Industrial Combustion, Inc., 4507 N. Oakland Ave., Milwaukee 11, Wis., Dept. SPI-859.

INDUSTRIAL COMBUSTION INC.

EXECUTIVE OFFICE: 4507 N. OAKLAND AVE., MILWAUKEE 11, WISCONSIN

Gas Tempering: **Report No. 1**

Electric Utilities Find Safe Superheater

Metal Temperatures Across Width of Superheaters of Typical B&W Boilers with Gas Tempering

BOILER No. 1

Average Metal Temperature	1040 F	
Deviation		±40F

BOILER No. 2

Average Metal Temperature	1035 F	
Deviation		±50F

BOILER No. 3

Average Metal Temperature	1125 F	
Deviation		±45F

Gas Tempering Assures Tube Temperatures

Longer Tube Life
Less Superheater Maintenance
Need For High Alloys Minimized

The ideal gas temperature to which superheater tubes should be exposed is the lowest temperature that will provide the required superheat and reheat with a reasonable amount of surface. If this temperature is exceeded in order to make a larger proportion of the total heat released in the furnace available for superheating and reheating, alloy requirements are increased and there is greater danger of superheater tube failure.

Now, the required heat can be delivered to the superheater *without exceeding desired metal temperatures* by the use of Gas Tempering.

Gas Tempering—is the reintroduction of cool flue gases near the furnace outlet to control the temperature of the furnace gases entering the superheater. It allows you to control furnace exit gas temperatures under all operating conditions.

Definitive Booklet: If you'd like to learn more about the economies and design flexibility available to you through Gas Tempering, write for Bulletin G-96. Address: The Babcock & Wilcox Company, Boiler Division, Barberton, Ohio.

Major Advantages of B&W Gas Tempering

. . . It cuts overall plant costs because the smaller size unit requires a smaller building per kw, a lighter foundation, less structural steel and shorter steam leads.

. . . It enables you to utilize the most economical available fuels. It permits the burning of a variety of coals without slagging, minimizes external corrosion of superheater tubes, and assures safe metal temperature, thus prolonging tube life, regardless of the fuel fired.

. . . It provides safe superheater tube temperature by positive gas temperature control; it protects superheater during startup and under all operating conditions.

. . . It makes it safer to design for economies offered by operation at steam temperatures of 1050 F and above.

B&W

THE BABCOCK & WILCOX COMPANY

BOILER DIVISION

G-936

Southern Pine Lumber Company at Diboll, Texas Now Buys All Its Power

No More Waste Fuel

Left to right: R. B. Stroud, District Manager of Texas Power & Light Co.'s Lufkin District; Gene Lawhorn, Texas Power & Light Co.'s Eastern Div. Power Consultant; Arthur Temple, Jr., President, Southern Pine Lumber Co.

SMOKING SAWDUST and slab piles have long been a scar on the Southern countryside. And conservationists have dreamed of the day when complete utilization would eliminate the great waste incident to manufacture of wood products.

That is why cessation of power production by a large wood processor is so important. It means the old waste fuel is now well-nigh non-existent — in one plant, at least.

SOUTHERN PINE Lumber Company, long a pacesetter for the lumber industry in the South, broke a new trail in April when it signed over to Texas Power & Light Company the task of supplying the total power needs for one of its two great forest products plants, the one in Diboll, Texas.

Most large sawmills generate their own power. The unprecedented move made Southern Pine Lumber Company the largest customer for Texas Power & Light in its Lufkin district and the fifth largest among all Texas Power & Light customers.

Progressive forest products utilization and plant efficiency were given as the reasons for the changeover.

According to officials of the Company, Southern Pine Lumber Company's utilization of its forest harvests has left only tree bark for fuel and rapidly advancing technology threatens even this source. The other reason given was that Texas Power & Light can produce power more economically than an individual consumer of Southern Pine's size.

The lumber company receives services from the TP&L transmission system at 69,000 volts. The power is then transformed down to 4,160 volts and distributed to various locations where power is used.

Southern Pine Lumber Company with plants at Diboll and Pineland, Texas is a complex of affiliated forest products manufacturing plants and material distribution stores. This system, in addition to being one of the largest manufacturers of quality lumber, produces 1/10th of the nation's mop and broom handles, 70% of the beverage cases of Texas, Oklahoma, Arkansas and Louisiana; 1/10th of nation's molded wood toilet seats, a major portion of its oak flooring and hardwood furniture parts. It includes 38 retail lumber yards, all in Texas, "from the Red River to the Rio Grande."

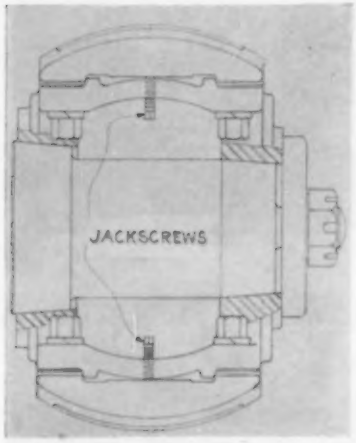
A giant new 125 million foot capacity insulation board plant at Diboll, most recent addition to the system, has been tied into TP&L power from its inception a little over a year ago.

Southern Pine Lumber Company with almost a half-million acres of pine and hardwood lands on a sustained yield is proud of its forest management. Boasting advance practices since the 19th Century, officials assert that the Company not only grows more every year than it harvests but that the timber is better every year. In addition, they say, conservation practices guard wildlife, soil and rainfall.

The principle source of power for the Diboll plant is Texas Power & Light's new steam generating plant at Stryker Creek about 60 miles northwest of Diboll.

Jackscrews Aid Alignment

THE SKETCH shows the installation of jackscrews in each end of the compressor crosshead frame used on 600 and 800 hp gas engine compressors. The idea was worked out to save time for our engine repair crews when adjusting the crossheads for proper clearances.



Previously, shims were installed or removed from the top crosshead shoe until the compressor piston rod was level (its normal operating position); then to get the proper running clearance, the crosshead had to be lifted with a bar or chain hoist while shims were added or removed from the lower shoe.

By installing jackscrews, the compressor rod can be leveled by using the top jackscrews. Adjust the jackscrews until the rod is level, measure the space between the crosshead frame and slipper, and insert the proper size shims. Loosen the jackscrews, tighten the slipper in place, and recheck the rod for level.

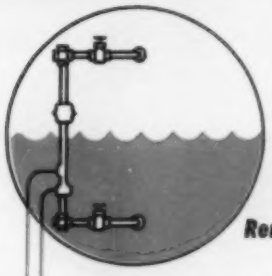
Place a feeler under each end of the lower crosshead slipper to give correct operating clearance, then tighten the lower jackscrews until the compressor rod is level. Measure the clearance between the crosshead frame and slipper and install shims of the correct thickness. Loosen the jackscrews, tighten the slippers, and recheck the rod level. Remove the feeler gauges and, for safety of operation, remove the jackscrews.

By installing jackscrews in the

Know all your water levels—*every minute*—

with the help of

Reliance EYE-HYE®



Remote indication saves time—increases safety

Any water-containing vessel is a potential hazard, whether it's fired or unfired. For most efficient control, *gages for all vessels should be out in the open, or at control stations.*

Where remote reading gages should be used:

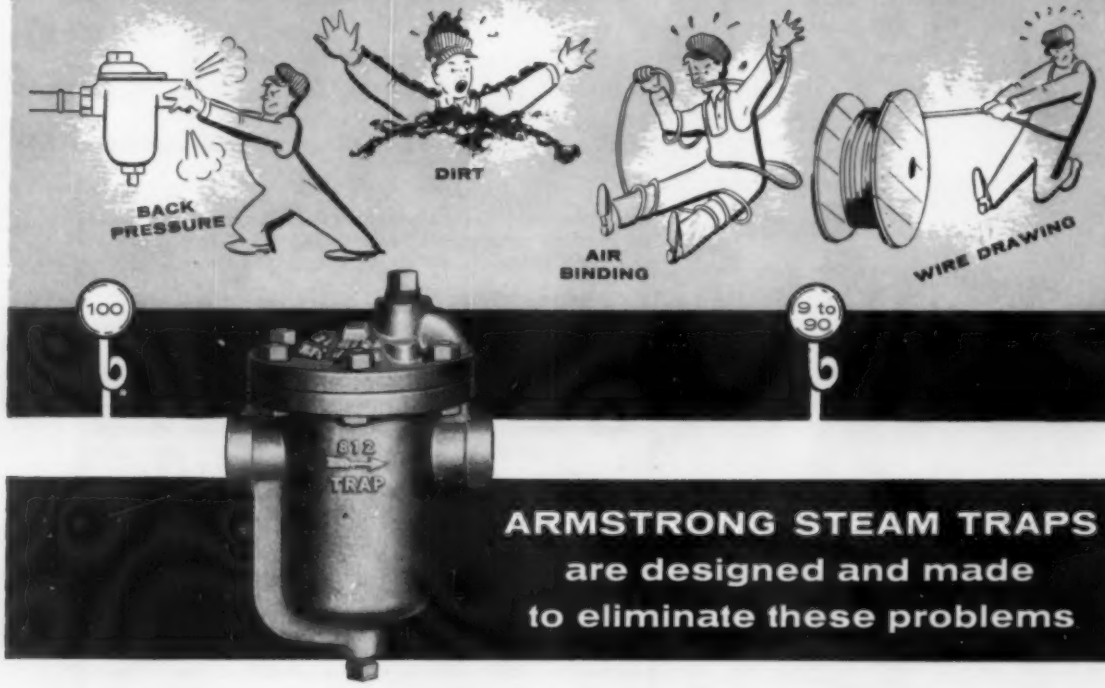
Stationary power boilers
Feed water heater tanks
Waste heat boilers
Surge tanks
Water treatment systems
Heating boilers
Storage tanks
Marine power boilers

What you should expect in a remote reading water level indicator	Reliance EYE-HYE
Flexibility of placement. Gage reading precisely where most convenient to use — even above the boiler.	✓
Sharp visibility. Easy to read green indicating fluid, illuminated.	✓
Scientific accuracy. U tube manometer principle for laboratory exactness.	✓
Simplicity. Smooth hydrostatic action — no mechanical working parts.	✓
Safety. Invites frequent reading — an aid to preventing water level accidents.	✓
Easy installation. Flexible tubes from boiler to gage window.	✓
Low maintenance. Scheduled cleaning only at infrequent intervals. Easy to blow down.	✓

Write for Bulletin CO and learn how EYE-HYE can increase the reading efficiency of all your liquid levels.

The Reliance Gauge Column Company
5902 Carnegie Avenue • Cleveland 3, Ohio
Representatives in all principal cities

Have you ever been troubled by any of these steam trap problems?



ARMSTRONG STEAM TRAPS are designed and made to eliminate these problems

BACK PRESSURE . . . Armstrong Traps operate on any back pressure—or vacuum, for that matter. As long as there is a pressure differential across the trap, it will close on steam and open for condensate. Even the high back pressure caused by blow through of one or more traps in the system will not disturb Armstrong Traps. Other than a reduction in capacity, Armstrong Traps are unaffected by back pressure.

DIRT . . . Armstrong Traps are not affected by ordinary dirt. When the trap opens condensate swirls down under the edge of the bucket and up through the discharge orifice. Dirt is kept in suspension and discharged along with the condensate. For very bad dirt conditions, Armstrong offers traps with integral strainers. These cost less than a trap plus a separate strainer.

AIR BINDING . . . Armstrong Traps cannot air bind. Air in the system passes through a vent in the top of the bucket. It collects in the top of the trap and is discharged with the condensate. There is no chance for it to stop the trap. For low pressure on-and-off units where large amounts of air accumulate while the steam is off, Armstrong offers open float and thermostatic air vent traps in a complete range of sizes.

WIRE DRAWING . . . Armstrong Traps are designed and made to resist wire drawing. The valve and seat are tough stainless steel. The valve opens and closes tightly with a fast action and is always water sealed. There is virtually no chance for grit or sediment to lodge in the valve, virtually no chance to create conditions that lead to wire drawing.

There's no need to accept any of these problems as "inevitable." Your local Armstrong Representative can show you how to end them all. Call him today or write direct.

860 Series for low pressure heating service.

800 Series, side inlet, side outlet.

No. 801, side inlet, bottom outlet.

880 Series, integral strainer.

200 Series, bottom inlet, top outlet.

Forged Steel Series for high pressures, high temperatures.

The 48 page Armstrong Steam Trap Book tells how to correctly size, install and maintain steam traps for any pressure, any temperature, any load plus full catalog data on Armstrong Steam Traps. Ask for Catalog K.

ARMSTRONG MACHINE WORKS

8064 Maple Street Three Rivers, Michigan

Checking, inspecting and adjusting mechanism used in plant's electrical system.

Westinghouse furnishes a written report of the condition of all electrical equipment and recommendations on parts and repairs.

"now operating"... with a WESTINGHOUSE MAINTENANCE CONTRACT

Florida Steel Corporation in Tampa, Florida, started operations in September, 1958.

Mr. R. R. Black, Sr., General Manager, contracted with Westinghouse for a complete maintenance inspection and engineering service on a quarterly basis. He reports, "Our experience to date has proved to us that our Westinghouse Maintenance Contract has already paid for itself many times. Down time is at a minimum, and when troubles develop, we are assured of fast, capable service."

You can now have a Westinghouse maintenance engineer check and test all of your electrical equipment under contract—weekly, monthly or yearly, depending on your needs. These scheduled inspection recommendations and adjustments can prevent equipment failure, reduce outages and down time to a minimum.

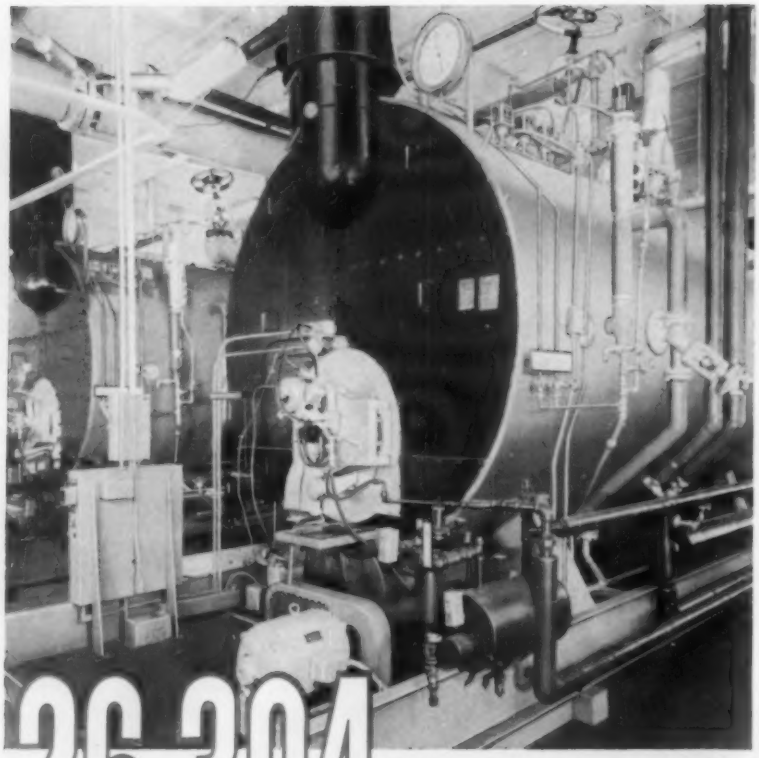
For complete information, call or write Westinghouse Electric Corporation, 1299 Northside Drive, N. W., P. O. Box 4808, Atlanta 2, Georgia. J-95206

YOU CAN BE SURE...IF IT'S

Westinghouse

WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS" CBS TV MONDAYS

Contract service offered in Westinghouse Southeastern Region Only.



26,304 hours of dependable process steam

Except during annual 2-week vacations, these Cleaver-Brooks packaged boilers have operated continuously for 3 years

At C. F. Mueller Co., Jersey City, largest American producer of macaroni and egg noodles, even a brief unscheduled boiler shutdown would ruin $15,000 worth of drying products. To insure against this possibility, two 400-hp Cleaver-Brooks Model LR-600-40 high-pressure boilers were installed for low-pressure operation.

These packaged boilers, which also supply steam for the firm's plant-heating system, operate 24 hours a day, 7 days a week for 50 weeks a year. C. F. Mueller Co. officials report very little maintenance is required.

This is one of hundreds of installations in which Cleaver-Brooks packaged boilers are saving money on initial installation, upkeep, long-term investment, and day-in and day-out dependability.

Cleaver-Brooks manufactures 130 packaged boilers, 15 to 600 hp, gas, oil or gas/oil fired. For details on any application, call your representative or write Cleaver-Brooks Company, Dept. J, 305 E. Keefe Ave., Milwaukee 12, Wis.

Cleaver Brooks®

ORIGINATOR AND LARGEST PRODUCER OF PACKAGED BOILERS

crossheads we reduced the manhours required to adjust the crossheads from 16 to 4 hours per engine, besides getting longer life and better performance from our compressors.

By BOYD BALL, Gas Engineer,
Honolulu Oil Corporation
Sundown, Texas

Water

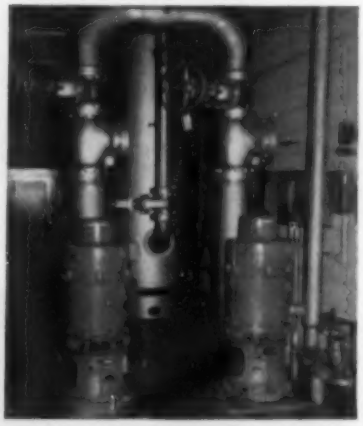
WATER doesn't wear out. So we use it over and over again.

It's an enormous problem to slake the thirsty requirements of our many manufacturing processes, air conditioning units, air compressors, welding equipment and other water consuming devices.

However, by installing a recirculating water supply system, we have realized savings of over $30,000 per year.

The recirculating system consists of an underground water storage pit, capable of holding 15,000 gallons of water, recirculating pumps and cooling towers located on the roof of the plant.

The recirculating pump (see photo) pumps the water from the underground storage pits, located directly under the floor, up to the



cooling towers on the roof and then to required use.

This recirculating system enables us to statistically control the amount of new water entering the system, thereby effecting real savings.

By H. E. MUNGAN, Manager-Plant Facilities, General Electric Company, Lynchburg, Virginia.

NEW Product Briefs

. . . there is always a BETTER WAY

Disintegrating Machine

H-1 A new type of metal disintegrating machine has been developed by **Jiffy Disintegrators, Inc.,** 1503 East 11 Mile Rd., Royal Oak, Mich. This model is ideal for burning shaped holes into hardened metals, cutting key ways, extending oil lines or for missing operations.

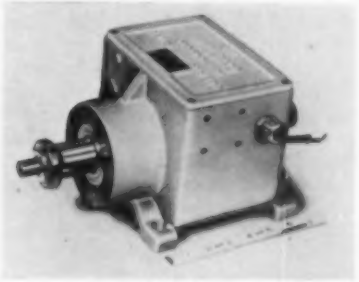
This new model J-2 Jiffy disintegrator operates on an electro-magnetic principle, which eliminates all springs, drive pins, fiber pads, helical copper coils and solenoids. It now has more controlled drive and lift power, more sensitive vibration control for making very small diameter holes and without damage to the threads in a tapped hole or to the metal adjacent to the hole being made.

Intermittent Drive

H-2 A new, completely packaged machine that provides precise intermittent motion from a constant source of rotary power has been introduced by the **Hilliard Corporation,** West Fourth St., Elmira, N. Y.

The machine is called the "I.D.U." for Intermittent Drive Unit and the compact size allows it to be installed on existing equipment, designed into new machinery and re-used after production line changes.

All of the I.D.U. parts are totally enclosed in an oil bath housing making it ideal for dusty, "steamed" or "wash-down" conditions. The single package unit gives precise control of any intermittent motions desired, clip and bend, shear or slash, oscillate or repeat, raise or lower, index and position. The use of the I.D.U. eliminates the need of buying separate parts and assembling a special "custom" machine with assorted mechanisms to apply and control it.



The I.D.U. can be installed as easily as a motor and needs only electrical connection. With an I.D.U., hand or foot operated equipment can be mechanized, existing power operated machines can be automated and it can be used as a "building block" in designing new machinery or production drives. The unit features highly flexible control, manual, mechanical or electrical, permitting "demand" type operations in fixed or variable cycles.

Speed Drives

H-3 A new line of adjustable speed drives in the 1/6 to 10 hp range has been announced by **Cleveland Machine Controls, Inc.,** 1155 Brookpark Road, Cleveland 9, Ohio.

These drives employ a magnetic amplifier unit driving thyratrons in

a full wave circuit, followed by a d-c shunt motor. Speed ranges of 100:1 and regulation percentage of 1-2% are attained without tachometer feedback.

Flexibility results from modular construction, permitting the user to select only the features required for the application. Standard optional characteristics include dynamic braking, reversing, jogging, remote control, torque limiting and line voltage compensation.

A non-electronic line is also available for use where exacting speed regulation is not of prime importance. Available in the 1/6 to 3 horsepower range, these drives use adjustable auto-transformers and rectifiers. Speed range is 100:1, regulation approximately 200 rpm no-load to full load, based on 2000 rpm base speed.

Poly-Rope

H-4 Poly-Rope is a triple-strand rope of polyethylene plastic — two strands of yellow, one black, — manufactured by **Industrial Products Co.,** Philadelphia 33, Pa. The rope has excellent dielectric properties, is not affected by oil, will not readily absorb dirt, and may be easily cleaned. Also, it is durable, has low water absorption, will not sag or stretch, is light in weight, flexible, may be cut to desired lengths and ends taped, and may be spliced. 5/16" Diameter-Tensile strength over 1200 pounds — will not sag or stretch.

For More Free Data FILL IN CODE NO. on the Handy Return Card — Page 81

New Product Briefs (Continued)

Automatic Filter

H-5 **The American Air Filter Company,** 215 Central Ave., Louisville 8, Ky. has announced the Type B Rollotron, which combines the high efficiency of an electronic precipitator with the low maintenance of an automatic, renewable media filter.

In the Rollotron, dry, electrostatically charged plates are used to agglomerate atmospheric contaminants — such as dirt, bacteria, pollen, smoke, etc. The agglomerated particles (including submicron sizes) are held together by intermolecular attraction until they are picked up by the air stream and deposited in the renewable media of the storage section. There the accumulated dirt is automatically wound into a compact roll for easy disposal. In the Rollotron resistance to air flow is uniform and constant and filter performance is always at optimum level regardless of job conditions.

Flexible Rubber Pipe

H-6 A complete line of wire-reinforced, flexible rubber pipe specifically designed to eliminate water line noises and to absorb "water hammer" has been announced by **Mercer Rubber Company,** Hamilton Square, N. J. These units, known as Vibraflex Vibration and Sound Eliminators, are so constructed as to absorb water pipeline noises emanating from the equipment to which the pipe is attached. Designed to "vibrate" at a frequency over 500 times lower than steel pipe, Vibraflex will absorb up to 90% of the noise and vibration.

The flexibility of Vibraflex rubber pipe section overcomes system alignment and facilitates installation of equipment. Having a full-faced molded rubber flange at each end, when Vibraflex pipe is connected into a system, there is no metal-to-metal contact at the joint. Hence, it prevents electrolytic action.

Being extremely abrasion- and corrosion-resistant, Vibraflex is an ideal and most economical replacement for steel and cast iron pipe in the conducting of corrosive chemicals and abrasive materials such as sand, gravel, salt, ashes, grains, chemicals, ore in water suspension, metal shavings and other materials where working pressures do not exceed 250 psi and temperatures range up to 180 F. Vibraflex can also be supplied on special order to meet unusual oil and acid conditions.

Vibraflex pipe is regularly supplied in I.D.'s from 2" to 14" and in lengths from 24" up to 60". Special lengths and I.D. dimensions can be supplied on special order.

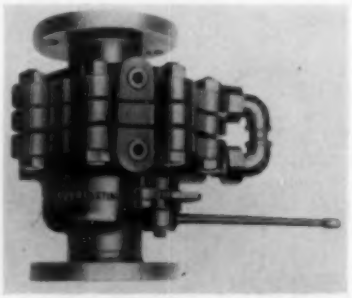
Vibraflex units are available in two styles: type 150 is designed for working pressures up to 150 lbs. Type 250 is recommended for working pressures up to 250 lbs. Type 150 has a full-faced molded rubber and duck flange backed up by a split steel retaining ring. Type 250 has the molded rubber and duck flange backed up by a solid steel retaining ring which is vulcanized to the flange, becoming an integral part of the pipe.

D-C Generator

H-7 Direct current generators manufactured by **Kato Engineering Company,** Mankato, Minnesota, are now available in sizes ranging from 500 watts to 40 kw with various voltages throughout the line. Both shunt and compound wound units are available throughout the range of sizes.

The machine illustrated is a 6 kw, 40/60 volt, 1800 rpm two bearing d-c generator. It is shunt wound, permitting it to be used for battery charging and is of drip proof construction. Typical of other machines in the line, it has commutating poles, in this case four, in addition to the field poles which improves commutation as constant location of the commutating zone is maintained regardless of load changes. Brush sparking is greatly reduced and overall generator performance is improved. These machines provide d-c current for cathodic protection which reduces underground pipe corrosion.

Construction features include heavy cast endbells and frame, grease sealed ball bearings and single segment commutator bars. Laminations are punched from best quality dielectric steels. Coils are heavily insulated, banded, thoroughly impregnated with thermosetting varnish and baked, making the armature one solid homogeneous mass.



Steam-Jacketed Valve

H-8 Free flow of numerous types of viscous materials through valves is assured with the newly designed steam-jacketed valve of the **Everlasting Valve Company,** Jersey City, N. J.

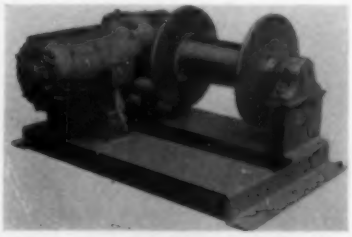
The design change assures constant temperature for materials which will congeal or harden and will not flow at ordinary temperatures.

Universal Flame Detecting Unit

H-9 **Minneapolis - Honeywell Regulator Company,** 2747 Fourth Ave. So., Minneapolis 8, Minn. has introduced a detection device for use on all types of commercial and industrial heating or processing burners.

Heart of the system is the company's recently unveiled ultraviolet-sensitive tube. The tube works with an amplifier circuit in the new self-contained Honeywell C7012A Ultra Vision Flame Detector system to add up the impulses of electrical energy generated by the tube as it counts the ultraviolet rays present in all types of flame.

An output of two microamps from the ultraviolet-sensitive tube is necessary to prove the flame radiation circuit and indicate a minimum satisfactory flame condition to assure safe burner operation.



Electric Hoist

H-10 A new "800 Series" of Electric hoists introduced by **King Manufacturing Corp.,** 3146 W. Chicago Ave., Chicago 22, Ill., features a reduction in weight through all-steel welded construction of the spool or drum which formerly employed cast iron spool ends. Weight reduction averages 20%.

The new hoist has an electric brake on the motor for remote control pushbutton operation. Available in various sizes from ½ hp up; wide range of speeds and capacities available by rearranging standard parts. It is compact in design and the gear runs in an oil bath.

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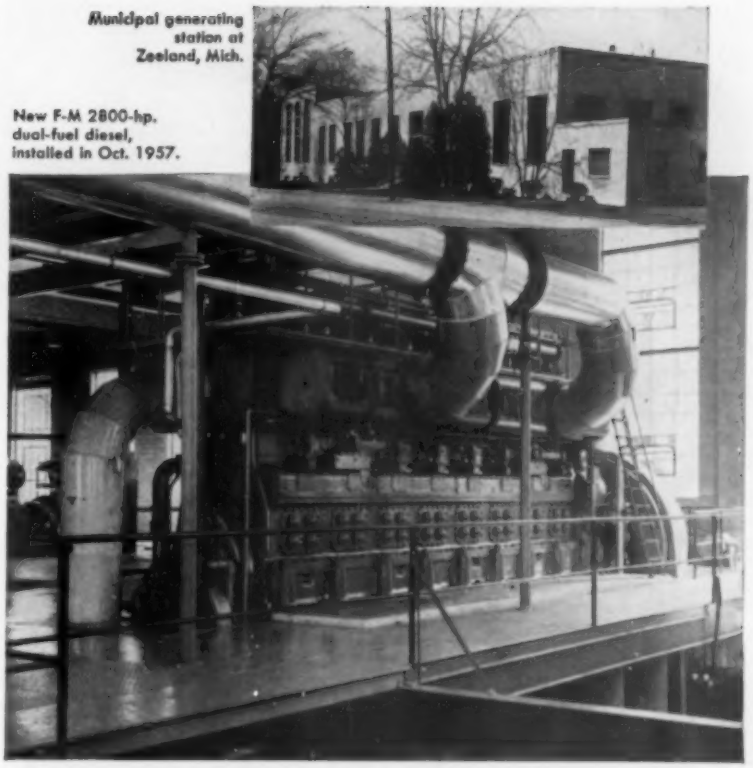
Municipal generating station at Zeeland, Mich.

New F-M 2800-hp. dual-fuel diesel, installed in Oct. 1957.



Even with poor load factors

new F-M dual-fuel diesel cuts fuel costs 21% for Zeeland plant!

From July through October 1958, this 2800-hp. Fairbanks-Morse dual-fuel diesel produced 71 percent of the 4,502,000 kw. hr. generated at the Zeeland, Michigan municipal plant.

The big Model 31AD18 engine averaged 5.74 mills per kw. hr. for this period—bringing average fuel cost for the plant down to 6.52 mills from an average 8.24 the previous year, a 21 percent reduction in fuel costs! The figures are even more impressive when it is realized the F-M diesel was operating at poor load factors, often well below 50 percent. Despite this disadvantage, F-M dual-fuel design made the operation profitable—even with gas costing 45¢ a thousand cubic feet and pilot oil 12.5¢.

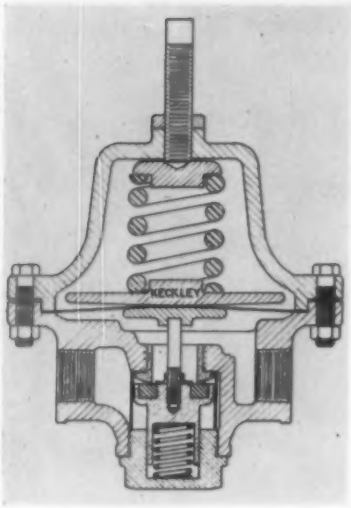
Outstanding economy and dependable performance of six Fairbanks-Morse diesels in the plant are paramount in Zeeland keeping residential rates among the lowest in Michigan—averaging 2.3¢ a kw. hr. for the last fiscal year. For information, write Fairbanks, Morse & Co., 600 South Michigan Avenue, Chicago 5, Illinois.

FAIRBANKS-MORSE

a name worth remembering when you want the BEST

DIESEL, DUAL FUEL AND GAS ENGINES • LOCOMOTIVES • ELECTRIC MOTORS • GENERATORS
PUMPS • SCALES • COMPRESSORS • MAGNETOS • HOME WATER SYSTEMS

New Product Briefs (Continued)



Reducing Valve

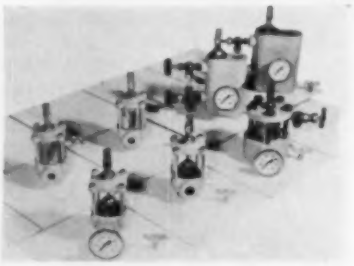
H-11 An economical pressure reducing valve featuring increased flow, called the No. 11A, has been introduced by **O. C. Keckley Company**, 3400 Cleveland St., Skokie, Ill. to serve steam, air, water, oil and gas applications.

The new No. 11A features a full ported orifice which permits high capacities; and provides economical service for many applications presently requiring larger valves. Reduced pressures range from one pound to 100 lbs. Interchangeable standard composition discs are applied for specific services, i.e., steam, air, water, oil and gas. Sizes ⅜" to 2".

Adjustable Orifices

H-12 A new line of micro adjustable orifices has been introduced by **Stickle Steam Specialties Co.**, 2215 Valley Ave., Indianapolis 18, Ind.

The orifices are designed to provide more accurate drainage of condensate from heating and processing units operating at pressure between 5 and 400 psi. Because they require virtually no maintenance and offer precise adjustment for minimum steam loss, orifices are frequently used to replace hard-to-maintain steam traps.

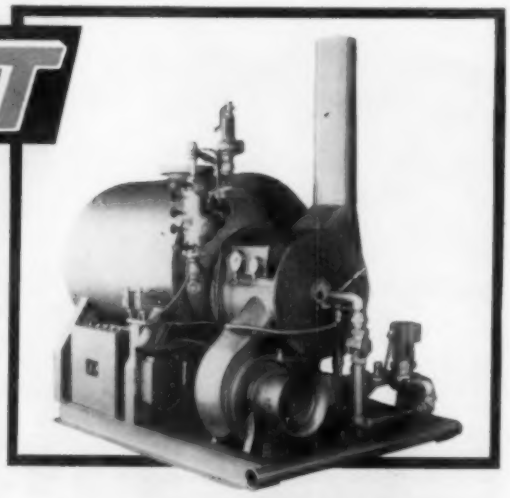


An exclusive needlepoint valve permits minute adjustment to regulate flow of condensate. To prevent unauthorized changes, adjustment requires a special key. All models are available with thermometer to show temperature of condensate leaving the processing unit. This temperature corresponds very closely to the temperature in the unit itself. On low pressure models, self-cleaning sight glasses permit visible operation of the valve and a sight check on the flow of condensate.

The orifices are offered in seven styles and six sizes to fit ½" to 2" pipe.

TXT

Vapormatic Coil-N-Shell Steam Generator gives you more horsepower . . . more steam generating capacity in much *less* space



The Vapormatic Coil-N-Shell requires only a fraction of the space used by conventional boilers of comparable horsepower and generating capacity. Its capacity is 5 to 150 psig steam outlet pressure with a power range from 35 to 300 HP.

A forced circulation, water tube type steam generator, the Coil-N-Shell is completely unitized with all components assembled as an integral unit on a common base. It generates steam from a cold start in ten minutes and is ready for high temperature immediately.

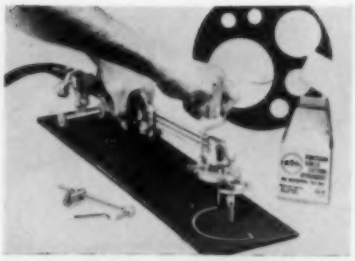
The Vapormatic Coil-N-Shell is completely automatic. All sizes have modulating controls as standard equipment. Available with gas, oil and combination gas-oil fuel burning systems.

Complete specifications and operating data for all sizes are contained in Bulletin 582 CSA. Write for your copy now.

The Vapormatic Coil-N-Shell is quoted and shipped ready to fire up when feedwater, fuel, steam and electric lines are connected.

TXT TEXSTEAM Corporation
A SUBSIDIARY OF VAPOR HEATING CORPORATION

320 Hughes St. • P. O. Box 9127, Houston 11, Texas • Phone WA 8-8853



Hole Cutter

H-13 A new patented tool, costing about one-tenth that of large complicated machines, is being manufactured by **Ideas, Inc.**, 214 Ivinson Ave., Laramie, Wyoming, for cutting precision holes and various shapes in thick metal plate. Developed for use by the U. S. Navy, the tool attaches to any acetylene cutting torch for such applications as cutting holes through metal walls and decks for pipe and electrical conduit. Squares, rectangles, and odd-shaped holes and solid figures can also be accurately formed for welding fabrication. Because of the tool's small size, it will operate in confined spaces, heretofore usually performed by laborious and expensive free-hand cutting. Marketed under the trade name, Or-O-Co, this new universal tool is priced less than $40.

Air Operated Gun

H-14 Among several new spray guns recently introduced by **Eclipse Air Brush Co.**, 390 Park Ave., Newark, N. J. is the Auto-Rod, air operated gun.

The lightweight gun is ideal for installation on machines with moving guns. All three hose connections (fluid, atomizing air and control air) are parallel and angled away from the spray area where space is critical. Simple mounting brackets allow the gun to be placed almost anywhere.

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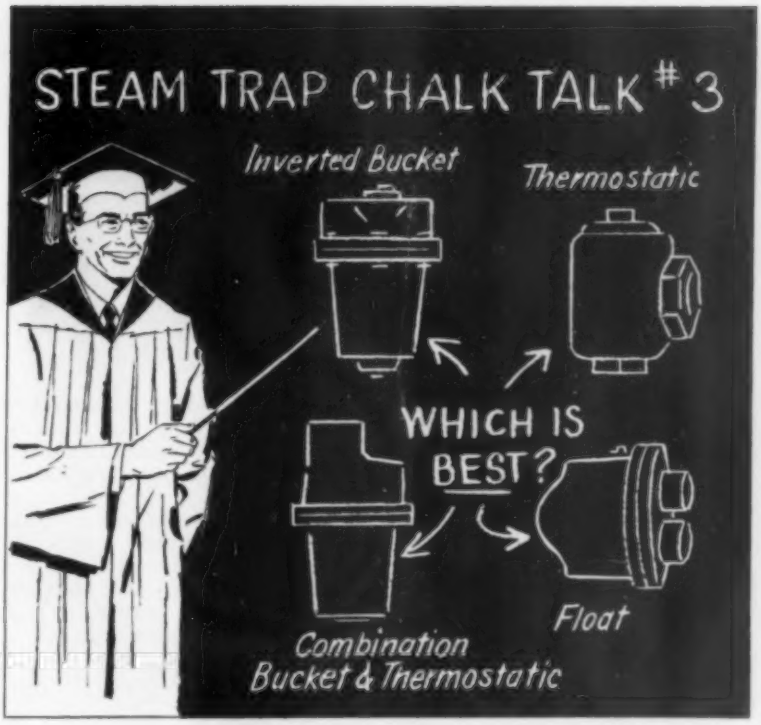

Is one trap design better than another?

● The steam trap user is often confused by the fact that there are four different designs of traps on the market. Is one better than another, and if so, which one should he use?

Actually, each design of trap has its place, *depending upon the application.* For example, thermostatic traps are preferred for chemical, petroleum and other outdoor applications because they cannot freeze. However, they do not compare in efficiency with inverted bucket traps for normal inside use. Where fast heating up is required, the combination bucket and thermostatic trap permits steam units to reach maximum heat 2½ times faster. For continuous service, float traps are best.

For sound recommendations, ask Anderson. Manufacturing a complete line of traps, in all designs, they give unbiased counsel. Their engineering catalog, "How to Select Steam Traps and Other Fluid Specialties" contains hundreds of worthwhile recommendations. Mail coupon for your copy today.

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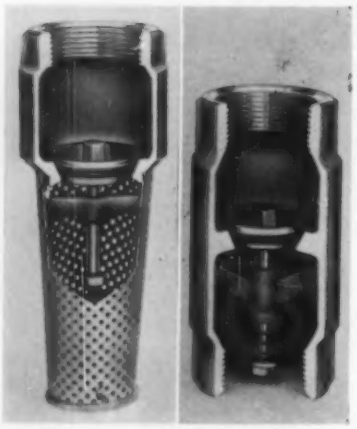
New Product Briefs (Continued)



Foot & Check Valves

H-15 Long life foot and check valves for pressures up to 200 pounds are offered by **Richter Supply Co.**, Madison, Ga. Valves are furnished with special non-rolling "O" Ring equipped Poppets. Tapered screens installed on rugged frame of foot valves eliminate damaged screens when pipe is lowered into well. Stainless steel springs are standard equipment on check valves.

Ricman valves can be furnished with "O" Rings that will stand up to 600 F for a small additional cost.

Cleaning System

H-16 Factory cleanliness is a simple matter with Exidust Central Vacuum Cleaning System from **Lamson Corp.**, Syracuse 1, N. Y. System, consisting of five components — cyclone type primary dust separator, secondary bag type separator, exhauster and motor unit, piping system, and fixed pick-ups or flexible nozzles, handles dry clean-cut metal and plastic chips. Shown above is a flexible nozzle for operator's use; fixed pick-ups, fastened on machine where chips are formed, collect waste automatically. System, which has a capacity ranging from 3 to

100 hp, has three big housekeeping advantages: safely gets rid of machine chips, especially flammables like plastics; keeps machine free of chips, thereby lessening downtime or operational wear due to chips lodging in vital machine parts; salvages scrap for re-sale or re-working.

Each installation is individually engineered, based on such factors as: number of operators, type of operations, size of hose and plant layout.

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Finnigan Hot Water Generators are engineered to give you large quantities of hot water for low operating cost. The finest materials, creative skill and quality construction assure efficiency in Finnigan equipment. These generators are fabricated from corrosive-resistant materials and contain copper removable-coil heating elements.
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New Orleans 25, La., 4054 Thalia Ave.
New York 17, New York, 41 E. 42nd St.

Acrylic Paint

H-17 Industry's first use of durable long-wearing acrylic paint on high voltage power circuit breakers and other outdoor switchgear equipment has been made by **General Electric's** High Voltage Switchgear Department in Florida.

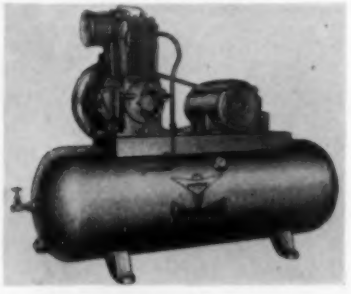
The new acrylic resin paint, similar to paints being used by automobile manufacturers on new model cars, provides greater resistance to all atmospheric conditions.

It was found to have far greater resistance to acid and alkali impurities in the air than present paints being used.

In comparative gloss reflection tests, acrylic paint proved four times better after six months of sun, water and salt exposure at a test center in Florida.

While providing customers with a more durable, long-lasting finish on outdoor equipment, the new acrylic paint will substantially lower maintenance costs since repainting time will be extended.

It is fully expected that the life of this new acrylic paint will be more than double that of the paints previously used.



Air Compressors

H-18 A complete line of air compressors for industrial applications has been introduced by **Lincoln Engineering Company**, 4010 Goodfellow, St. Louis 20, Mo.

These reciprocating compressors are available in over 200 models, with motor or engine capacities from ¼ hp to 20 hp, air displacement up to 92 cfm, and tank capacities up to 200 gal.

Both horizontal and vertical mounted tank models are equipped for automatic start and stop operation; horizontal models also offer continuous service operation. All models are loadless starting; motor is allowed to attain full speed before compression starts.

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New Product Briefs (Continued)

Portable Conveyors

H-19 Compact and portable, the new low-cost "Economy" conveyor produced by **Bosworth Manufacturing Company**, 34250 Mills Road, Avon, Ohio is only 4½" wider, at any point, than the conveyor belt itself. The conveyor easily fits into the cramped space between machines and within existing production lines.

All-steel and ruggedly built, the "Economy" conveyor is designed to transport castings, stampings, blanks, screw machine parts and scrap to another machine or a tote box. Easily moved from machine to machine, it can be quickly set for any incline angle from 22° to 45° simply by adjusting the telescoping legs.

18 models are available with oil resistant belts that are 6", 12", 18" or 24" wide and 4, 6, 8, 10 or 12 feet long. The user has a choice of integral 1" rubber cleats vulcanized to the belt or metal cleats bolted to the belt or, where high temperatures are present, an all-metal belt.

Vibrator

H-20 A new portable air vibrator that can be attached to almost any type of frame, bin, box or table without use of bolts, is now available from **Cleveland Vibrator Co.**, 2828 Clinton Ave., Cleveland 13, Ohio.

This portable Cleveland 3" VGV air vibrator has jaws that open to 2 inches and is attached simply by tightening the vise-like clamp which is a part of the vibrator.

A big advantage of the new VGV lies in the fact that it is completely portable. No bolts, brackets, or pins are required to mount and dismount the vibrator.

This vibrator also has an eye through which a hoist hook may be attached for ease in moving the vibrator around the shop.

The overall dimensions are 14¾ x 13 x 6", weight is approximately 90 pounds. It develops 3600 vpm at 60 psi with air consumption of approximately 20 cfm.

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Concrete Drill

H-21 One-inch-a-minute speeds in drilling holes in concrete — regardless of the size of hole — have been attained with a new drilling tool manufactured by **Bill Jack Scientific Instrument Co.**, Solana Beach, Calif.

The pounding-action of the tool, which combines rotary action with rapid "jack-hammer" blows, operates at the rate of 4,000 to 7,000 impulses a minute while the drill bit revolves at 650 to 1200 rpm.

Even though the tool can drill holes from ½" to four inches in diameter, it is readily portable, weighs only 30 pounds, and operates on 115 volt household current or from a small 1.5 kw gasoline generator, either a-c or d-c current. Average power consumption is 9 amps.

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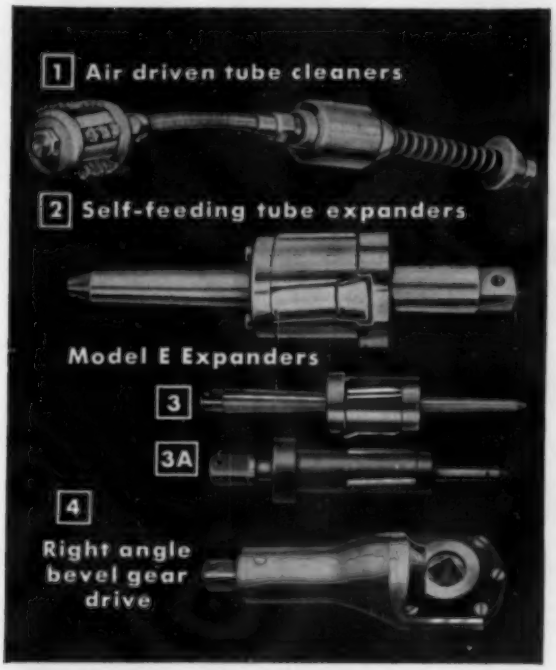

1 Heavy-duty air driven tube cleaners are designed to deliver maximum power at the most efficient cutter head speeds while negotiating sharp bends, the Model ECT Air Cleaners are excellent for cleaning curved boiler tubes from 2½" to 4½" O.D.

2 Wilson Model 38 tube expanders are self-feeding and parallel expanding. They are of the single flare roll type. Available for tubes 1" O.D. to 4½" O.D. with various roll lengths for tube seats ¾" and up.

3 Flaring type expander 1" O.D. to 4½" O.D. tubes, ½" to 2" tube seats.

3A Long reach type expander 1" O.D. to 4½" O.D. tubes, 2½" to 5" tube seats.

4 This Wilson bevel gear drive is expressly manufactured to meet continuous and heavy duty service conditions. The one piece all steel body is extremely rigid and not subject to distortion. The maintenance of perfect gear alignment is assured with consequent long service life.

Write today for your copies of Wilson Tube Cleaner catalog No. 77 and Wilson Tube Expander catalog No. 88. TW-822

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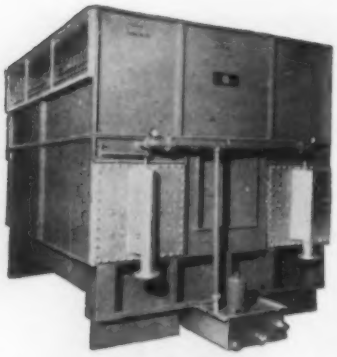

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You will make major water savings, reduce your costs, solve your problems of water supply or disposal and get HIGH OPERATIONAL EFFICIENCY with Niagara "Aero" Evaporative Heat Exchangers, After Coolers or Condensers for these important plant services or processes:

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- COOLING ROLLS, WELDERS, DRAWING OR EXTRUSION DIES
- PRODUCT AND PROCESS COOLING CHEMICALS OR INTERMEDIATES
- COOLING LIQUIDS OR GASES IN CLOSED SYSTEMS
- VAPOR CONDENSING UNDER VACUUM
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High operational efficiency means: precise temperature for improved product and process quality control, heat removal at rate of input, simple operating conditions, real economy in upkeep, sustained full capacity.

Also it means cooling in a closed system with your product kept free from contamination or, when condensing, getting a pure condensate holding high quality in your product or material.

Niagara machines do the work of a cooling tower plus shell-and-tube coolers with a single machine that saves piping, water handling disposal and treatment expense and 95% of water consumed by contact cooling methods.

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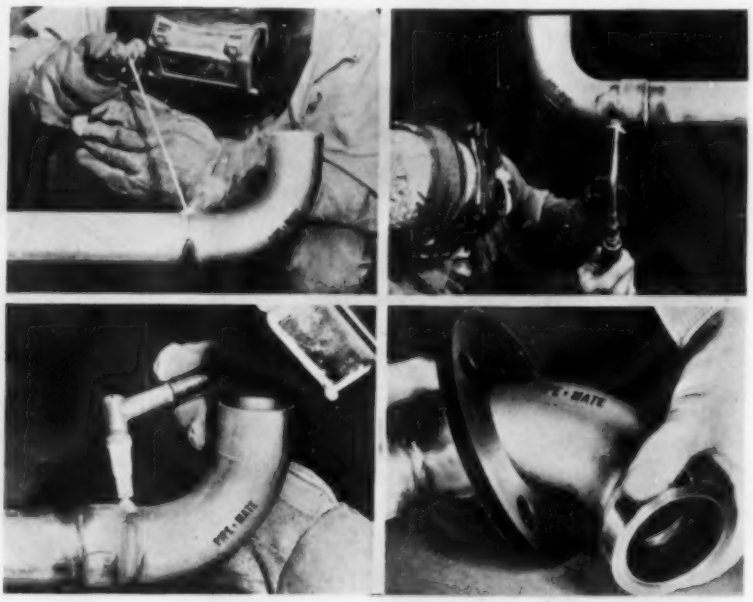
New Product Briefs (Continued)



Stainless Fittings

H-22 **Tube Turns Division of Chemetron Corporation,** Louisville, Ky. has introduced a new line of light-wall stainless steel fittings and flanges designed for nominal-temperature, low-pressure non-critical process piping.

The new line, called "Pipe-Mate," will be stocked in ½" through 4" sizes, Schedule 5S and 10S, in the stainless steels grades best suited to corrosive applications in the large middleground area of roughly 150 psi or less.

In addition to providing lower-cost fittings for non-critical applications, the new line features long tangents that permit easy alignment of fittings and pipe and that allow clearance for fabrication of completely flanged elbows, returns, tees and crosses.

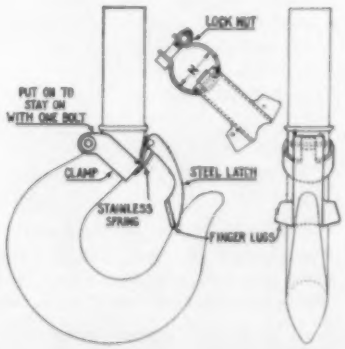
The Pipe-Mate line has a swivel-type insert flange especially designed for ease of alignment. It is a carbon steel flange and has a stainless steel insert at the bore into which pipe or fitting can be expanded. Then the carbon steel portion is simply rotated to line up the bolt holes and tightened. No welding is involved. Another feature of the new line is a reversible fitting called the "Plug-R-Cap." Butt welded in regular position, it is a cap. Reversed, it can be easily fillet welded to act as a plug or pipe closure.

Safety Latches for Hoist Hooks

H-23 A hoist hook attachment designed to convert a plain hook to a safety hook in a few minutes with only simple tools has been developed by the **Harrington Co.**, Plymouth Meeting, Pa.

The Safety Latch is sufficiently ductile to permit closing into close contact with any hook shank and is securely held in place by a bolt and lock nut. Sufficient sizes are available to fit any hoist hook.

The lugs on the sides of the latch keep the operator's fingers out of the danger zone.



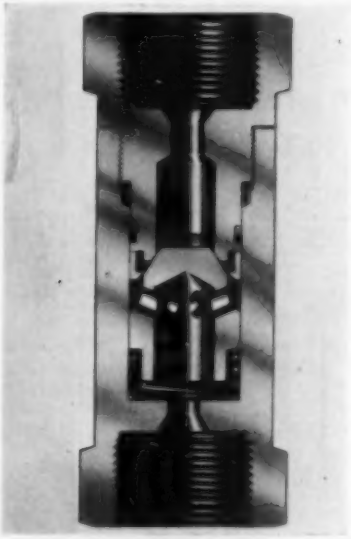
Buck & Boost Transformers

H-24 **Jefferson Electric Co.**, 25th and Madison Sts., Bellwood, Ill. has announced a new and complete line of Buck and Boost transformers, available in 20 models, covering 480 voltage transformations.

All models have a dual rated primary (120/240 V) . . . with a 12/24 V or 16/32 V secondary. Mr. E. M. Nesvig, Jefferson Sales Manager, says, "These new Buck and Boost transformers round out our complete line of Dry Type transformers — from small control units thru the 300 KVA 3-phase transformer."

Check Valve

H-25 A new, heavy duty check valve, designed especially for high pressure gas services to 10,000 psi, has been introduced by **Republic Manufacturing Co.**, 15655 Brookpark Rd., Cleveland 35, Ohio. It is equally suitable for high pressure liquid services. A safety factor of 4, and the novel means of retaining the seat, make it particularly applicable for high flow, heavy surge applications.



All metal parts are stainless steel. Choice of Teflon or synthetic rubber seals. Made for connections with Bureau of Standards high pressure tubing and also available with flared and flareless tube connections and for pipe. Services up to 10,000, depending upon strength of tube and fittings. Temperature range dependent upon composition of seat and seal.

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New Product Briefs (Continued)

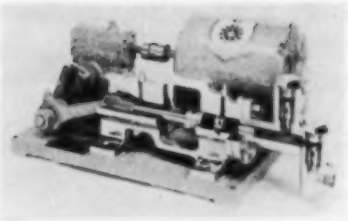
Spark Protection

H-26 **Automatic Transportation Co.'s,** 149 W. 87th St., Chicago 21, Ill., battery powered, stand-up, end-control Docker can now be furnished with Underwriters' Laboratories "Type EE" spark protected label. "Type EE" trucks may be used in locations classified as Class I, Division 2 (i.e. paint spraying or dipping, solvent recovery, rubber cement mixing), Class II, Division 2 (grain handling in bags or closed containers) and Class III, Division 2 (storage of textile and cordage fibers, excelsior, kapok or Spanish moss).

Thus the Docker, in capacities of 1500 to 3000 pounds, 24- and 30-volts, meets all the specifications as outlined in "Standards for Safety, Power-Operated Industrial Trucks" Manual UL583. All switches, controllers and contactors are enclosed in a steel case which is mounted on battery compartment cover and in no way interferes with the operator's vision.

Proportioning Pumps

H-27 High pressure, low capacity, variable volume, reciprocating plunger pumps for feeding as little as 1.5 gph to as much as 108 gph of corrosive or non-corrosive liquids are available from **Walter H. Eagan Co., Inc.,** 2336 Fairmount Avenue, Philadelphia 30, Pa.



in addition to packaged chemical feed units incorporating these pumps with tanks ranging from 50 to 250 gallons capacity. The pumps normally handle pressures to 625 psi and several thousand psi with special construction and are available in 304 and 316 stainless, Hastelloy, Carpenter 20 and other steels and ceramic plungers when corrosive liquids are to be metered. Accuracy is maintained through double suction and double discharge ball checks and seats which have long life since the design eliminates excessive spinning of the balls, seat wear and pockets where harmful deposits may build up. Manual or automatic adjustment of the stroke can be made from 0 to full stroke while the pump is in operation through a special stroke control mechanism.

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100% AUTOMATIC

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Tank Contents Gauges

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Route 30, Lincoln Highway, Shortest Route to Pittsburgh

Cyclone Separator

H-28 A cyclone separator being introduced by **Torit Manufacturing Company**, Walnut and Exchange Sts., St. Paul, Minn., operates in the 4,000 to 6,000-plus cfm range.

The new model features adjustable belt drive to give a wide range of cfm performances against varying resistances. Its long tapering cone design and high inlet velocity place it in the high efficiency cyclone separator classification.

The 36-FM model is designed for outdoor exhaust.

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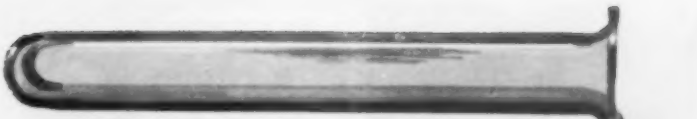
Corrosion Inhibitor

H-29 Use of sodium molybdate as a corrosion inhibitor in aqueous recirculating systems may find widespread commercial adoption for the first time as a result of a new development by **Climax Molybdenum Company**, 500 Fifth Ave., New York 36, N. Y.

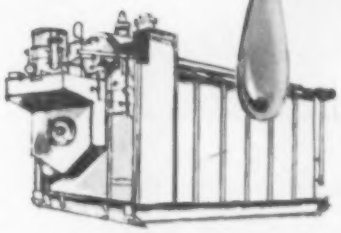
This new advance — application of sodium molybdate in combination with orthophosphate — now makes it possible to reap sodium molybdate's advantages at a much lower cost than when used alone.

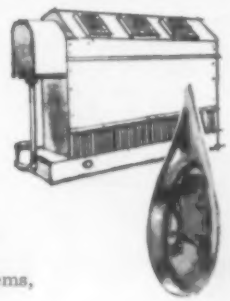
Sodium molybdate has been known for some time to be an effective corrosion inhibitor which offers the benefits of being relatively non-toxic and colorless.

This development is expected to find particularly wide acceptance in equipment where toxic materials can not be used — refrigeration systems for food-stuffs, for example.



Pennies for Prevention Beat Dollars for Repair





Expensive boiler and air conditioning equipment must be kept clean of corrosion, scale and sludge to operate at peak efficiency, and avoid costly repairs. Industrial Products Company feedwater treatment for industrial steam-water systems, approaches and corrects the problems peculiar to the Southeast. IPCO service provides accurate analysis and recommendations for chemical treatment to prevent formation of scale, corrosion and sludge.
Technical work by Industrial Products Company professional chemical engineers and chemists, who survey and evaluate water conditions of your particular location, assure you proper internal treatment methods. All equipment and procedures including in-plant chemical control backed by laboratory analysis and research give your preventive maintenance program the necessary complete follow-through.
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IPCO PRODUCTS

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New Product Briefs (Continued)

Flooring Material

H-30 Superior resistance to chemical attack and mechanical abuse are claimed for Emeri-Epox, a new fast setting flooring material introduced by **Walter Maguire Company, Inc.**, 60 East 42nd St., New York 17, N. Y.

Emeri-Epox combines a specially graded emery, a hard, tough, non-absorbent material developed by Maguire for heavy duty industrial concrete, and an epoxy resin, a strong, 100% solid chemical binder.

Extremely resistant to abrasion and mechanical shock, the new material is applied in thicknesses from 1/16" to ¼" and can be feathered to a membrane-thin edge. It is flexible, but it won't shrink. It is completely waterproof. It won't freeze, a property that assures long shelf life. Surface is abrasive, therefore non-slip.

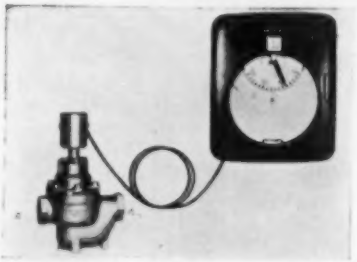
Emeri-Epox is supplied as a package containing two components, the dry mix of emery aggregate and epoxy resin, and a liquid catalyst. These are thoroughly intermixed just prior to application on clean, oil and grease-free, surfaces.

The mix is spread in place, screeded to the desired thickness, and troweled or darbied. Full curing results in eight to twelve hours at room temperature (70 F). Curing can be hastened by the use of heat lamps or forced air heating.

Emeri-Epox is available in a 17½ pound pail and economy-size 122½ pound drum. Standard colors are gray, tile red, and tile green.

Boiler Meter

H-31 **The Henszey Company**, Watertown, Wisconsin, has announced the manufacture of a remote-mounted boiler meter that accurately and inexpensively meters, indicates and records the total feed to the boiler and gives a permanent record of boiler output.



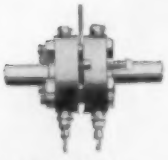
With this meter, the daily feed loads may be read on a continuous integrating recorder, the instantaneous load may be quickly checked on the visual Flowrator, and the peak load is accurately and permanently recorded on the 24-hour chart.

This Henszey meter is rugged and versatile, making it ideal for measuring raw feed makeup, processing returns, and boiler blowdown.

Now! Accuracy, Economy, Durability!

ELLISON FLOW TUBE METERS

Continuous, precision measuring of flows of air, gas, water, oil or other liquids and steam is readily provided by this single Ellison Flow Tube Meter. Easy to install in line. Easy to read. Mercury of oil gages with 10", 12", 20" or 30" scales. Equalizers available with needle valves, for differential static pressures above scale range. Send for Bulletin 219.



ORIFICE FLANGE

ORIFICE PLATE

Orifice flanges and plates available for use with Ellison Flow Tube Meters.

ELLISON DRAFT GAGE CO., INC.

554 WEST MONROE STREET SINCE 1896 CHICAGO 6, ILL.

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Cleaning System

H-32 **Detrex Chemical Industries, Inc.,** Box 501, Detroit 32, Mich., has announced a new model Econo-Sonic Unit that is a complete cleaning, distillation and filtration system in itself. Priced at only $1,750, this new ultrasonic unit pre-cleans, ultrasonic cleans and pressure-spray-rinses. It is ideally suited for the use of manufacturers of small precision parts.

It is compact in design, measuring only 38½" wide, 17½" deep and 28¼" high, yet provides all facilities needed to g.ve the finest in production cleaning in its work-size capacity.

Thermostat

H-33 A new explosion proof thermostat has been announced by **Fenwal Incorporated,** Ashland, Mass.

Designed for convenient immersion in tanks, wall installation, and for exposure to contaminated environments, the unit is made up of three sub-assemblies: a Series 47000 Thermoswitch unit, stainless steel well, and an explosion proof junction box that completely protects the lead wire outlets. The unit is completely adjustable over a 32 F to 500 F range, and can be exposed indefinitely to —100 F, or, for short periods, to 100 F above its set point. Current rating is 10 amps 15 VAC, or 5 amps 230 VAC.

For More Free Data FILL IN CODE NO. on the Handy Return Card — Page 81

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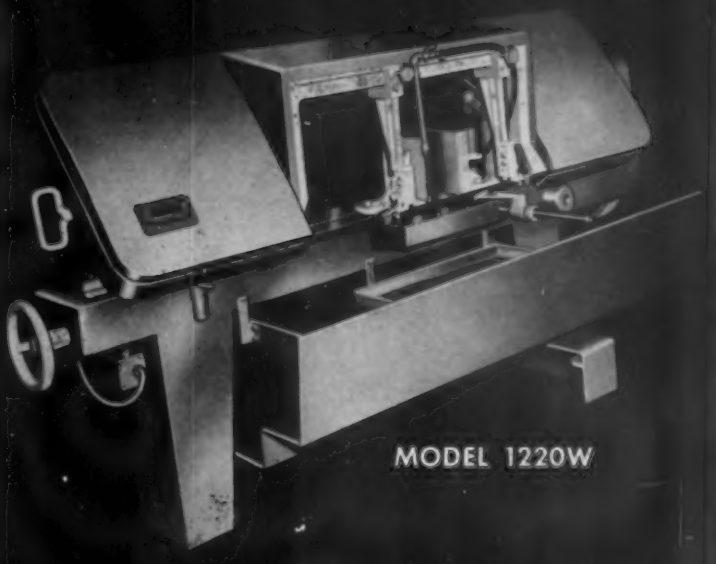

MACHINE TOOL DIVISION

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NEW Catalogs & Bulletins

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MAINTENANCE—TOOLS EQUIPMENT & METHODS

1—Neoprene Rubber-Coating—Charcote, a waterproof protective barrier against rust and corrosion described in 4 p bulletin. Offers plant engineer outstanding protection against corrosive fumes, salt spray, abrasion and moisture. — CHARLESTON RUBBER CO.

2—Electrical Maintenance — New contract service (for Southeast only) inspects and tests motors, generators, gearing, control & distribution systems, etc., at a cost less than 1% of value of equipment. — Atlanta office of WESTINGHOUSE ELECTRIC.

13—Conveyor Belt Repairs — Bulletin R-700 and Folder R-4 describe the "Rema" method of making vulcanized repairs without heat. Holes, gouges, rips and tears can be repaired on the job. Curing time delay is eliminated. Belts can be put into service immediately after repair is made. — FLEXIBLE STEEL LACING COMPANY.

14—Triple-Purpose Gun — Low-cost Carco Gun ($16.50) described in form C-100; ideal for fast, efficient sand blast, liquid, or air cleaning of small parts and surfaces. Operates on any standard air pressure system. — C. A. ROESCH & CO.

17—Mechanical Packings — 32 p Cat. PC-103 describes a variety of packings & gaskets, including self-lubricating, sheet and molded packings, etc. Includes application charts and price information. — GREENE, TWEED & CO.

29—Belting Repairs — Two bulletins "How to Properly Join Belts" and "Belt Fastener Selection Chart" offer service help on conveyor, elevator and transmission belting. — CRESCENT BELT FASTENER CO.

32—Scale Removal — Data sheet on Kwik-Kleen, a completely safe method of rapid scale removal for heat transfer surfaces.—THE NORTH AMERICAN MOGUL PRODUCTS COMPANY.

96—Tube Cleaners — Mechanical units for boilers, condensers, evaporators and pipes described in Catalog 77A. Over 100 pages of air motors, cutting heads, drills, etc. — THOMAS C. WILSON, INC.

FANS—PUMPS—COMPRESSORS HEATERS—HEAT EXCHANGERS

107—Proportioning Pumps—4 p brochure illustrates and describes company's proportioning pumps and package chemical feeding units. Includes applications and specifications. — BIRD ARCHER CO.

123—Slurry Pump — Catalog describes the new SP-90 slurry pump which permits proportion of slurries in the mix tank to remain constant, with pumping rates variable from maximum of 1/5 of maximum. — MANZEL.

142—Centrifugal Pumps — Full line of single stage horizontally split case centrifugal pumps described in 16 page Bulletin 721.6; capacities 200-6400 gpm; heads up to 425 ft; maximum standardization and interchangeability of parts.—GOULDS PUMPS, INC.

160—Boiler Feed Pumps—12 p Bulletin 122 describes and illustrates the type BFI high pressure pumps. Design features, service ratings and engineering data included.—PACIFIC PUMPS, INC.

165—After Cooler — Bulletin 130 shows how the Aero unit removes moisture from compressed air or gases; cools water for jackets and intercoolers; cools air or gases in both power and process systems; and protects air tools and pneumatic systems from water damage.—NIAGARA BLOWER COMPANY.

INSTRUMENTS—METERS CONTROLS—REGULATORS

200—Control Centers — Built to specific needs of the job to prevent costly breakdowns later. Units custom-built from best components. Specializing in quick deliveries. — THOMAS B. COMBS COMPANY.

213—Meters & Controls — Bulletin G15-1 describes and illustrates systems and instruments used in the measuring, transmitting, receiving, interpreting and controlling of 18 variables normally encountered in power plant and industrial plant operation. — BAILEY METER COMPANY.

225—Cooling Controls — Self-powered controls for compressors, stills, solvent coolers, degreasers, small engines, etc., described in Bulletin 710; operational and hook-up sketches.—SARCO COMPANY INC.

231—Control Valves — Catalog No. 305 illustrates and describes construction and specifications for a wide line of air operated diaphragm control valves suitable for the majority of general process applications and plant services. — MASON-NEILAN.

234—Soot Blowing Control Systems —16 p Bulletin 1029 describes line of systems. Gives complete engineering description and illustrations of Selective-Sequence and Automatic-Sequential insert-type panel controllers. List of typical installations show a wide variety of applications. — COPES-VULCAN DIVISION.

258—Temperature Regulators — Bulletin 5307A describes temperature regulators that vary the flow of steam or cooling water to heater or process to automatically maintain constant temperature. Includes sizing and capacity data.—LESLIE CO.

298—Boiler Control Systems — GPS-901 describes power, steel, marine and industrial boiler control systems and components. Also temperature and process control systems. Water treatment chemicals, boiler compounds and inhibitors for industrial and municipal purposes. — HAGAN CHEMICALS & CONTROLS, INC.

265—High Pressure Water Columns — Brochure BO—Intro to high pressure (251 to 2500 psi div. of catalog data. Describes construction of higher pressure water columns; gives reference list of gages and sup-

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Bulletins (Cont.)

plementary equipment. — RELIANCE GAUGE COLUMN CO.

287—Color-Port Water Gage — Bulletin WG-1814 describes the new gage for high pressure boilers (up to 3300 psi). Gives full details on design and operation and shows how it gives greater visibility and greatly reduced maintenance requirements. —YARNALL-WARING COMPANY.

PLANT CONSTRUCTION—WELDING EQUIPMENT—SPECIALTIES

300—Fact Folders — 23 up-to-date industrial fact-file folders on aluminum, steel, copper, stainless steel, insulation, roofing and other industrial supplies immediately available from 9 Southern warehouses. — REYNOLDS ALUMINUM SUPPLY CO.

301—Vacuum Cleaning Systems — How portable and stationary systems cut costs and increase plant efficiency shown in Booklet P8 and AB-100. Eight heavy duty units (1½ to 15 hp) for cleaning hard to get at areas, reclaiming valuable materials, etc. — U. S. HOFFMAN MACH. CORP.

308—Wrought Iron in Steam Condensate Lines — Special report contains information on factors affecting corrosion, comparative service records, suggestions for minimizing maintenance. — A. M. BYERS CO.

313—Ice Making Machine — Packaged unit ideal for remote locations in sizes from 150 lb/day to 2000 lb/day; choice of electric motor or gasoline engine drive. — EQUITABLE EQUIPMENT CO.

323—Mercury Vapor Fixture — Industrial color corrected units described in Bulletin 401. "Stabilux Socket" secures bulb end of lamp, eliminating lamp rupture and breakage from vibration. — WIDE-LITE CORP.

324—Painting New Plants — "Plan Painting of New Plants to Reduce Costs" describes how company's lead-suboxide paints can save 1 or 2 coats of paint on new plants. Eventual repainting costs are cut as well since these paints for a dense, metallic lead film which can be recoated without expensive scraping, sanding or repriming. — SUBOX INC.

334—Storage Racks — Bulletin 17SP shows how Rackmaster Fittings cut rack-building time as much as 60% by eliminating threading and welding. Pipe 100% salvageable. — THE HOLLAENDER MFG. CO.

335—Classifying Systems — Bulletin explains general operating characteristics of centrifugal and gravitational type classifiers. Curves illustrate high efficiencies achieved in actual installations and indicate particle size distribution of incoming feed, separated fines and coarse material. — BUELL ENGINEERING CO., INC.

336—Retaining Walls — Catalog RW 3555 shows how bin-type walls stabilize slopes and gain valuable ground for buildings, parking areas; all metal cellular construction; all-bolted assembly means small crews can do the job. — ARMCO DRAINAGE & METAL PRODUCTS, INC.

342—Power Roof Ventilators — Bulletin 550 describes V-belt driven centrifugal type power roof ventilators. Pressures to 2" SP; capacities from 1500 to 26,500 cfm.—CLARAGE FAN CO.

386—Rigid Frame Buildings—8 page bulletin "Dixisteel Rigid Frame Buildings" — low cost, flexibility of design, durability, and minimum maintenance; also triangular or bow-string truss all-steel roof systems; fabricated for rapid erection. — ATLANTIC STEEL COMPANY.

PIPING—VALVES—FITTINGS STEAM SPECIALTIES—TRAPS

406—Blow-Off Valves — Catalog B-434 describes the valve to use for boilers to 2500 psi. Disc has welded-in stellite facing and inlet nozzle has integral welded-in heavy stellite seat. — YARNALL-WARING COMPANY.

411—Steam Trap Book — 44 page Steam Trap Book contains useful data on trap sizing, calculation of condensate loads, installation and maintenance data. — ARMSTRONG MACHINE WORKS.

420—Valves — 24 page Catalog illustrates and describes bronze, iron, steel and corrosion-resistant valves for controlling the flow of water, oil, gas, steam and corrosive fluids. — THE WM. POWELL CO.

426—Pressure Regulating Valves — Standard line of regulating valves for steam, water and air service described in Cat. 77. Complete specification data. — MASON-NEILAN DIV.

437—Piping for Permanence—Bulletin covers a variety of services where wrought iron pipe saves because it serves longer. Corrosion costs you more than wrought iron. — A. M. BYERS COMPANY.

440—Steam Trap Troubles — Booklet for plant engineering personnel "Banish Your Steam Trap Troubles." —YARNALL-WARING COMPANY.

468—Steam Traps—40 p engineering manual aids engineers and maintenance men in sizing, specifying and buying of steam traps and other fluid specialties. All data necessary to engineer a trap installation is included. — V. D. ANDERSON CO.

471—Pipe — Catalog 575C lists specifications for all sizes of pipe from ⅛ in. to 24 in. in diameter. Tables give data and description, wall thickness and weight. Also describes company's pipe fabrication facilities for structural uses. — L. B. FOSTER CO.

479—Multiport Drainers — Publication 5201 containing 8 pages describes units for removing large quantities of condensate under vacuum or pressures, as from evaporators, heaters, separators, coils, or steam lines (up to 200 psi maximum). Lists discharge capacities, shows features and typical installations. — COCHRANE CORPORATION.

BOILERS—STOKERS TURBINES—BURNERS

504—Steam Generators — Bulletin AXY - 1 describes auxiliary equipment and design features of the Amesteam Generator for sizes 10 through 600 hp and illustrates how this integrated design reduces cost and increases life and reliability. — AMES IRON WORKS, INC.

509—Free Coal Counseling — General information on how Coal Bureau engineers will advise on selection, transportation and utilization of the right coal for your purpose.—NORFOLK AND WESTERN RAILWAY.

510—Vibra-Grate Stoker — Water-cooled vibrating grate stoker in sizes from 25,000 to 150,000 lb of steam per hour; no dust collector required and assures freedom from smoke, even at low ratings; easily adapted for burning gas or oil in combination with coal, or singly; requires minimum maintenance. — AMERICAN ENGINEERING CO.

515—Packaged Steam Generators — Bulletin PSG-2 describes factory assembled portable type units from 10,000 lb/hr to 40,000 lb/hr capacities. Gives construction details and dimensions. In standard pressures of 175,250 and 375 psi gauge. — HENRY VOGT MACHINE CO.

Bulletins (Cont.)

516—Small Boiler Performance — 4 p Bulletin shows how the packaged Ljungstrom air preheater boosts performance. Boilers as small as 25,000 lb/hr can have advantages of regenerative preheating—saves fuel, boosts output, and permits use of lower grade fuels. — THE AIR PREHEATER CORPORATION.

523—Soot Blowers—Bulletin 1030 describes Vulcan T-30 retractable soot blowers, available in lengths up to 38 ft. Includes sectional drawings and special design features. — COPES-VULCAN DIVISION.

530—Coal Plant Specifications — 64 page brochure, including 5 drawings, is a comprehensive guide for preparing specifications on coal-fired, low-pressure heating plants in the size range of 750,000 to 5,500,000 Btu/hr. All aspects affected by choice of fuels from storage bin to stack design covered fully. — BITUMINOUS COAL INSTITUTE.

531—Fuel Oil Treatment — Data sheet describes how Mogul treatment disintegrates, dissolves and disperses sludge in fuel oil storage tanks and equipment. Thru sludge dispersal, maximum vaporization and combustion are possible. — THE NORTH AMERICAN MOGUL PRODUCTS COMPANY.

535—Unit Steam Boilers — Catalog AD-100 — Gives complete information on oil and gas fired "Self Contained" boilers, 15 to 500 hp, 15 to 250 psi for processing and for heating. Gives features, applications, efficiencies, capacities and dimensions. — CLEAVER-BROOKS CO.

545—No. 6 Oil Burner — Low pressure air atomizing burner, described in Bulletin AD-158, is rated at 90 gph. Components include latest type of combustion controls. — CLEAVER-BROOKS COMPANY.

549—Firing Systems — Folder No. 5843 describes industrial packaged forced-draft firing systems for dual-fuel or single-fuel firing of high or low pressure natural, LP or manufactured gas or any grade of oil from No. 2 thru No. 6 in Scotch marine, steel firebox, water tube or cast iron boilers. Illustrated.—IRON FIREMAN MFG. CO.

551—Packaged Water Tube Boilers — Complete data and dimensions for boilers ranging from 8,000 to 50,000 lb/hr, firing oil or gas or both, described in 12 p Catalog 111-D. — SUPERIOR COMBUSTION INDUSTRIES, INC.

566—Packaged Combustion Unit — Completely piped, wired and tested factory assembly described in Bulletin B8/30. Has Kinetic gas burner, manual firing valve, automatic diaphragm gas valve and electronic combustion safeguard system incorporating RA680 cabinet. Available in 3 sizes with 8 capacities from 800,000 to 3,260,000 Btu/hr. — WEBSTER ENGINEERING CO.

570—Seamless Boiler Tubes — 44 page Bulletin 12 contains complete description of manufacture, advantages, tolerances, allowable stress and working pressures, bursting strength, weights, steam properties and other data. — NATIONAL TUBE DIV., UNITED STATES STEEL CORP.

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574—Packaged Generator — Bulletin 582 describes Vapormatic Coil-N-Shell Steam Generator for service requirements of 5 to 150 psig. Gives operation features and specification data. Available with gas, oil, and combination gas/oil fuel systems. — TEXSTEAM CORP.

586—Boiler Controls — Bulletin C1 describes automatic combustion controls for gas fuel firing of boilers of all sizes. Complete pneumatically powered systems of both the positioning and proportioning type are illustrated. — WEBSTER ENGINEERING CO.

ENGINES—DRIVES POWER TRANSMISSION MATERIAL HANDLING

601—Crane Runway Rails — Catalog gives information on crane rails, angle bars, crane stops, rail clips, hook and anchor bolts, bearing plates. Also specifications on various sizes of crane rail clips and explains how to order rails. — L. B. FOSTER CO.

602—Pneumatic Ash Conveyors — Bulletin S57-A describes pneumatic ash conveyors for rugged, wear-resistant pipe and fittings that provide lower maintenance cost per ton of ash covered. — NATIONAL CONVEYORS CO. INC.

603—Monorail Case Studies — File F-1 — Offers 20 new studies of engineered monorail applications in various industries. Factual information, complete with photos and plain drawings. — AMERICAN MONORAIL CO.

607—Crane Systems — Booklet 2008, profusely illustrated, shows how Tramrail transfer cranes can systematize handling; engineering and application data. — CLEVELAND TRAMRAIL DIV.

614—Vertical Transportation — Elevator Catalog — Describes and illustrates details of passenger and freight elevators, escalators, dumbwaiters, and modernization and maintenance equipment for use in industrial, utility and service plants. — OTIS ELEVATOR CO.

630—Mechanical Vibrating Conveyors — Catalog 890 gives information on conveyability and density of typical solid materials and provides data on how to "Do It Yourself" to get required length. — JEFFREY MFG. CO.

633—Shielded Electrification—Bulletin KS-1 describes "Kant Shock" for monorail and crane systems. Shielding prevents accidental contact with live bus bars. Eliminates all hazards of open bar conductors, prevents costly accidents, protects employees and reduces insurance rates. — AMERICAN MONORAIL CO.

639—Diesel Engines — 16 p Catalog BU-413 describes two new diesel engines — Model D-344 and D-516. Includes photographs, cutaways, charts and other illustrations. — ALLIS-CHALMERS MFG. CO.

640—Belt Conveyors — Manual 909 designed to serve both expert and layman in field of materials handling by conveyor. All but the most unusual applications can be specified from the contents. — JEFFREY MFG. CO.

WATER TREATMENT—HEATING & AIR CONDITIONING—DUST & FUME CONTROL—REFRIGERATION

706—Automatic Roof Cooling — Bulletin shows how automatic evaporative roof cooling can reduce inside temperature 8 to 15° without air conditioning; increase roof life; and reduce fire hazards. Many Southern installations. — APRIL SHOWERS — SOUTHERN.

711—Refrigeration Condensers—Bulletin RC-2 shows how Vogt condensers step up rate of heat transfer and step down head pressures. Closed type for clean waters; film type where water is hard and forms scale. Units save power and refrigeration cost.—HENRY VOGT MACHINE COMPANY.

716—Dust Collection — Whether nuisance elimination or process material recovery, check on Whirlex

Dust Collector Units. Engineering data available. — THE FLY ASH ARRESTOR CORP.

718—Zeolite Softeners — 20 p catalog 4520 describes the sodium zeolite softening process in detail. Contains data required for proposals, lists factors important in selection of proper zeolite material and in sizing of equipment. Single valve controls all cycles of service and regeneration. — COCHRANE CORPORATION.

722—Packaged De-Ionizers — Bulletin PK describes complete line of de-ionizers, which produce chemically pure water at flow rates up to 1000 gph. Standardized units, shipped from factory fully-assembled, eliminating complicated installation problems, and virtually eliminating service problems. Recommended for laboratory and plant production uses. — ILLINOIS WATER TREATMENT COMPANY.

729—Refrigerant Condenser — Bulletin 131 shows benefit of panel construction in condensers with capacities from 100 to 240 tons refrigeration. Illustrations, diagrams and photos explain functions of aero-evaporative condensers with Duo-pass precooling coil and oil remover. — NIAGARA BLOWER CO.

755—Cooling Tower — Bulletin DVAQ describes the double-flow Aquatower for industrial services involving intermediate-gallonages. Space saving line in wood or steel structure with asbestos cement board casing, in single or multi-cell units. — THE MARLEY COMPANY.

768—Steam Humidifiers — 16 page Bulletin No. 500 shows necessity of humidification, lists recommended storage and processing temperatures and relative humidities, lists regain of hygroscopic materials and complete physical details of all types of Armstrong steam humidifiers. — ARMSTRONG MACHINE WORKS.

774—Refrigerating Units — Bulletin 97-F, illustrates and describes low-pressure refrigerating units. — FRICK CO.

ELECTRICAL

801—Motors—Bulletin describes and catalogs more popular a-c motors from 1 to 600 hp, for every process and manufacturing requirement. Single phase and polyphase; surpass NEMA specifications. — BROOK MOTOR COMPANY.

802—Small Relays—Simple solenoid design with only one moving part described in Bulletin 700. Silver alloy contacts need no cleaning, filing, or other maintenance. — ALLEN-BRADLEY CO.

805—Power Factor Correction — 24 page catalog 50B shows how you can cut power costs by installing correction capacitors on motors and other inductive electrical equipment. Greater loads can be handled from existing circuits. Wiring, transformer and switchgear costs can be greatly minimized in new installations. — SPRAGUE ELECTRIC CO.

812—Open-Type Motors — Bulletin 05-51B9040 describes "Super-Seal" open-type motors which are unaffected by moisture, dust, dirt, oils, acids and alkalies. Motors have a 1.15 service factor which frequently permits using a smaller motor size. — ALLIS-CHALMERS MANUFACTURING CO.

820—Electrical Maintenance — New contract service (for Southeast only) inspects and tests motors, generators, gearing, control & distribution systems, etc., at a cost less than 1% of value of equipment. — Atlanta office of WESTINGHOUSE ELECTRIC.

839—Power Transformers — 8 p Booklet B-7299 "Preventive Maintenance of Power Transformers Through Modernization" includes component replacement descriptions, adaptions and methods of oil preservation. — WESTINGHOUSE.

842—Circuit Protection — Bulletin FIS describes the maintenance free Fusetron fuses which protect motors, solenoids, coils and transformers against burnout, and which increase production by eliminating needless blows.—BUSSMANN MFG.

855—Wiring Analyzer — 4 page bulletin describes Model 301 Adequate Wiring Analyzer which quickly, simply and easily tests wiring without confusing calculators or slide rules. — SPRAGUE ELECTRIC COMPANY.

879—Commutator Maintenance — 27 page booklet B-6150-A contains information on brush and commutator maintenance. Includes maintenance requirements, factors affecting commutation and carbon brush materials. — WESTINGHOUSE ELECTRIC CORP.

884—Portable Cords — Bulletin covers complete new line — Securityflex cords for severest applications; Industrial "all-purpose" cords for hard usage; and Service cords for shop appliances. — ANACONDA WIRE & CABLE CO.

"The herring-bone gears in the drive unit of our 6-stand, 10-inch mill that rolls our high speed tool steels became noisy. Inspection showed definite signs of flaking of gears. This was in 1939. It was then we started to use LUBRIPLATE in them and we have not encountered any flaking trouble since."

L. M. Potter
Purchasing Agent

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The largest furnace in the country producing merchant pig iron was recently placed in service as part of an expansion program by a major Southern mill. The new furnace has a rated capacity of 1000 tons per day and is one of the most modern in the country with respect to mechanization and automatic controls.

Because of their unique design and high erosive resistance, WHIRLEX heavy duty draft fans were chosen to handle the hot blast furnace gas. The three units shown here carry approximately 150,000 cubic feet of gas per minute. Preliminary fan examinations show wear to be less than a third that of ordinary fans designed for this purpose.

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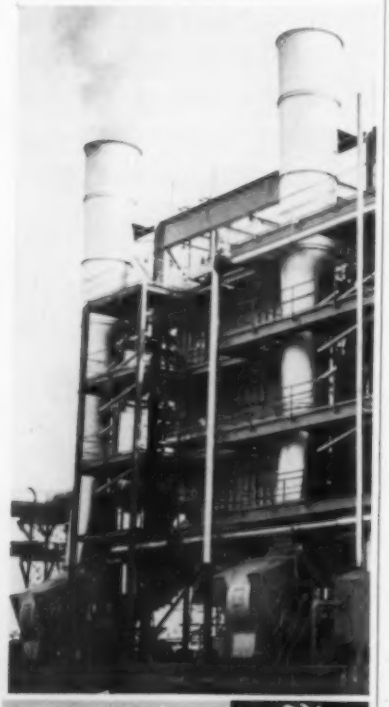

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WHIRLEX

Bulletins (Cont.)

V-1—Plastics Molding — Folder describes and illustrates a number of products manufactured for suppliers to textile and industrial users. — SOUTHERN PLASTICS ENGINEERING CORP., Box 6428, Greensboro, N. C.

V-2—Use of Plastics — "Guide to Use of Plastics in Production, Maintenance and Safety Applications" gives helpful hints on proper storage and care of plastic sheets, rods and tubes in customer's own plant. In columnar form for quick selection of right type plastic for specific applications. — COMMERCIAL PLASTICS & SUPPLY CORP., 630 Broadway, New York 12, N. Y.

V-3—Gear Pumps—Bulletin G-1 describes Herringbone Gear Pumps which are designed for difficult applications pumping liquids which have lubricating qualities. Includes dimensional data and driving power requirements. — SCHUTTE & KOERTING CO., Dept. P-G, Cornwells Heights, Bucks County, Pa.

V-4—Designing V-Belt Drives — 32 p Catalog DH-900 provides complete drive design information in power transmission, the Super HC V-Belt Drive. Contains Service Level information to help determine service life of the drive being designed. — GATES RUBBER CO., 999 So. Broadway, Denver 17, Colorado.

V-5—Motor Application—16 p Form 270 A, 1959 Motor Application Guide, includes nine major factors in motor selection. Polyphase, single phase and direct current motor selection charts given in detail. — CENTURY ELECTRIC CO., 18th & Pine Sts., St. Louis 3, Mo.

V-6—Deaerators — Bulletin 4528 describes deaerators for small and medium sized boiler plants with accessories and packaged for immediate shipment. — PERMUTIT CO., 50 W. 44th St., New York 36, N. Y.

V-7—Packaged Substations — 16 p Bulletin R-5604-1A describes line of Tranfo-Units, which are completely packaged, compact unit substations. Provides basic design, application and specification information. — I-T-E CIRCUIT BREAKER CO., 1900 Hamilton St., Philadelphia 30, Pa.

V-8—Dust Collector—Bulletin 272-B gives complete product information about the application, principle, design, construction, operation, installation, and arrangements of the Type D Roto-Clone dust collector. — AMERICAN AIR FILTER CO., INC., Dept. PD, 215 Central Ave., Louisville, Ky.

V-9—Refractory Cements — 16 p Booklet, "Cements, Mortars, Coatings," describes and gives data on the expanded line of products for furnace savings. — MEXICO REFRACTORIES CO., Mexico, Mo.

V-10—Fuel Solvent — Bulletin 594 describes Fuel-Solv, a fuel oil sludge solvent, which disperses and removes sludge present in tanks, suction lines, strainers, etc., as well as preventing new accumulations.— BETZ LABORATORIES, INC., Gillingham & Worth Sts., Philadalphia 24, Pa.

V-11—Vibration & Noise Control— 8 p Booklet K4E gives engineering specifications and performance data for 27 types of products for the control and measurement of machinery vibration, shock, and noise. Illustrated. — KORFUND CO., INC., 48-48G 32nd Place, Long Island City 1, N. Y.

V-12—Heat Exchanger Manual — Manual M-100 is a guide to the specification writer or engineer to simplify heat exchanger specifications by using a single modular hairpin unit for all duties. Section on design, materials, welding procedure, testing, inspection, etc., included. — BROWN FINTUBE CO., 510 Huron St., Elyria, Ohio.

V-13—Transmission Machinery — 8 p Bulletin A-706 is a comprehensive review of company's line of power transmission machinery.— DODGE MFG. CORP., Mishawaka, Indiana.

V-14—Compressors — 16 p Bulletin A-56 describes and illustrates Unitair compressors. Includes cross section drawings and a run-down on all vital components. — JOY MFG. CO., Oliver Bldg., Pittsburgh 22, Pa.

V-15—Sanitary Equipment — 20 p Book 2617 contains illustrations and photographs of the latest sanitary engineering equipment and shows flow diagrams of how this equipment can be installed in typical waste treatment plants. — LINK-BELT CO., Dept. PR, Prudential Plaza, Chicago 1, Illinois.

V-16—Shop Equipment — Form 2451 describes and gives specification data on various types and models of Erectomatic shelving and steel shop furniture. Illustrated.—STANDARD PRESSED STEEL CO., Box 864, Jenkintown, Pa.

V-17—Welding Equipment—24 page brochure evaluates 50 important design features found in oxy-acetylene welding and cutting equipment and industrial regulators from 19 manufacturers. Illustrated with cross section drawings. — MODERN ENGINEERING CO., 3411 Pine Blvd., St. Louis 3, Mo.

Southern News Briefs

(*Continued from Page 24*)

Allis-Chalmers Miss. & La.

The **Cabell Electric Company,** 422 South Farish Street, Jackson, Mississippi, has been appointed a distributor and agency for various Allis-Chalmers electrical products.

The company will serve as a distributor for Allis-Chalmers motors, control and transformers, and as an agency for Allis-Chalmers regulators, power transformers, switchgear, unit substations, and circuit breakers.

Area served on these products by Cabell Electric Company is all of the State of Mississippi except that part north of a line between Columbus, Oxford and Clarksdale; and East Carroll, Franklin, Tensas, Catahoula, and Concordia, parishes in Louisiana.

Cabell Electric Company is the oldest electric supply house in Mississippi. **J. B. Cabell** is vice president and general manager of the firm; **W. M. Berry** is treasurer, and **Hartwell Cook** is sales manager.

A. M. Byers — Tex.

Southland Supply Company, Dallas, Tex., has been appointed a distributor of polyvinyl chloride (plastic) pipe, for **A. M. Byers Company,** Pittsburgh, Pa.

Already a distributor of Byers 4-D wrought iron pipe, Southland Supply will distribute PVC pipe througout the Dallas area in cooperation with the Byers Houston office.

Southwest Supply is located at 2034 Amelia Street, Dallas.

Yale & Towne — El Paso

The **El Paso Flournoy Company, Inc.,** a leading Southwest industrial equipment supplier for the past 13 years, has been appointed West Texas and Southeastern New Mexico franchise representative for industrial lift trucks and tractor shovels for **Yale & Towne Manufacturing Co.**

Located at 1224 E. Missouri St. in El Paso, Tex. the new Yale sales and service outlet is presently constructing a new building that will double their present area for replacement parts inventories and service shop facilities.

El Paso Flournoy is operated under the direction of **Walter Miller, Jr.,** president, and Mrs. Mary Flournoy, secretary-treasurer. Both have been active in the field of industrial lift truck sales and service for more than 10 years.

Robert Lee Kellar is in charge of the service staff. El Paso Flournoy operates in addition to their internal facilities the only fully equipped mobile service units in West Texas.

Sales engineers who will represent Yale in the territory include Robert G. Newell, McK. G. Frey and Jay M. Turner.

FREE easy-to-use guide simplifies and improves your industrial customers' track maintenance.

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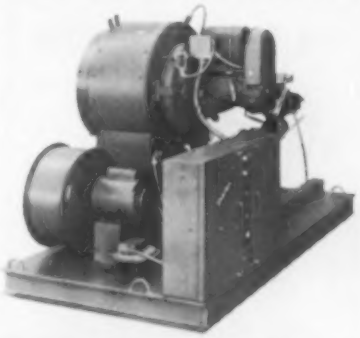

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SINGLE or DUAL FUEL
PACKAGED or FIELD ASSEMBLED
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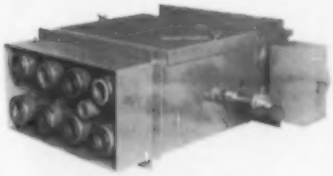
ELECTRONICS of ALL TYPES



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VALVE

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- DEAD END SHUT-OFF
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Clark Bros. — SW

The appointment of **Ernest G. Hotze** as Southwest Director Manager for **Clark Bros. Co.**, one of the Dresser Industries, has been announced. In his new post, Mr. Hotze will be responsible for the sale of Clark engines, compressors and gas turbines throughout Texas (except the Panhandle area), Mississippi, Louisiana, Southern Arkansas and Southern New Mexico.

Mr. Hotze has been with the Clark organization since 1942, serving respectively as technical service engineer, sales engineer, Assistant District Sales Manager, and since 1955, Houston District Manager.

Joe Y. Allen, Jr., former Assistant District Manager succeeds Mr. Hotze as Houston District Manager. He will be in charge of the Clark Houston and Corpus Christi Offices serving the Texas-Gulf Coast.

Also named as District Manager under Mr. Hotze is **James R. Hutton**, who will be in charge of the newly created Louisiana-Mississippi District serving Southern Arkansas, Louisiana and Mississippi. Mr. Hutton was formerly the Clark Shreveport, La. Branch Manager.

Holan Corp. Kansas City Manager

Dale Riedel is **Holan Corporation's** newly-appointed District Manager in Kansas City, Missouri.

In his new position, he will direct Holan activities in Iowa, Kansas, Nebraska and Missouri.

A former industrial salesman in Cleveland, Ohio, Riedel joined Holan in 1955. He has been engaged in Holan sales work in Ohio, Indiana and Kentucky.

Holan, manufacturer of utility truck bodies and truck-mounted power devices, has plants in Cleveland, Phoenix and Griffin, Ga., as well as in Brantford, Ontario.

Carolinas Virginia Nuclear Power Assoc.

According to E. H. Will, President of the Nuclear Power Associates, **Miles Cary**, Vice President of Virginia Electric & Power Co., has been elected chairman of the Steering Committee of **Carolinas Virginia Nuclear Power Associates, Inc.**, which is constructing an experimental nuclear reactor at Parr Shoals, S. C. for the production of electric power.

William N. Thomas has been appointed Nuclear Engineer, System Planning & Research Dept. of VEPCO and assigned on a full time basis as a principal assistant to the Engineering Director of CVNPA in Charlotte, N. C.

Mr. Thomas, who joined VEPCO in 1948, spent four months at the Argonne National Laboratory School of Nuclear Science & Engineering at Lamont, Ill. in 1956 in preparation for his work on atomic power plants.

Completion of the experimental reactor at the Parr Shoals steam and hydro plant of S. C. Electric & Gas Co. is anticipated by June 30, 1962 by the nonprofit partnership of VEPCO, Carolina Power & Light, Duke Power, and S. C. Electric & Gas Co.

Southern News Briefs

Chase B & C — Dallas, Tex.

Promotion of **Clifton D. McCarra** to district manager of the **Chase Brass & Copper Co.** warehouse and office in Dallas, Tex., has been announced by General Sales Manager Walter E. Evans. McCarra succeeds A. M. Johnson, who was recently promoted to district manager for Chase in Chicago.

A native of Pine Bluff, Ark., McCarra started with Chase in May, 1946, as an inside salesman at Houston, Tex., and soon was promoted to office manager there. In April, 1949, he was promoted to office manager at Dallas and for the past year has been an outside salesman.

Auxiliary Governor for Steam Turbines

A new type of auxiliary governor will be available on **Westinghouse Electric Corporation's** large steam turbines. Responding to acceleration instead of velocity, the new governor greatly improves emergency performance.

To further improve the governing system, Westinghouse engineers increased the oil pressure from 125 to 300 psi; and they are presently experimenting with 1000-psi components for possible future use.

The improved auxiliary governor gives an added measure of protection against turbine damage if the generator should happen to lose its load.

Aeroquip — South

Industrial distributors appointed by **Aeroquip Corporation** to distribute Aeroquip industrial products include Westbrook Supply of Camden, Inc., 207 Adams Ave., Camden, Ark., Boggs & Company, Inc., 2019 Thrift Rd., Charlotte, N. C. and Elm Equipment Co., 256 N. Washington Avenue, Mobile, Alabama. Aeroquip Corporation has general offices in Jackson, Michigan. Other Aeroquip plants and warehouses are located in Los Angeles, California; Dallas, Texas; Paterson, New Jersey; Van Wert, Ohio; and Toronto, Ontario.

Wis. Protective Coating — East

Wisconsin Protective Coating Co., Green Bay, Wisconsin has announced the appointment of J. P. Fuller, Inc., Elizabethton, Tennessee, as sales representative to cover Eastern Tennessee, Western Virginia, and Northern Alabama.

Porter Acquires National Electric

H. K. Porter Company, Inc. is continuing its expansion in the electrical equipment industry with the announcement by T. M. Evans, Chairman, of the acquisition of the business of **National Electric Products Corporation**, Ambridge, Pa.

The new National Electric Division of Porter will continue to manufacture and market the well-known product lines of rigid, thin-wall and flexible steel conduit, boxes and fittings, building wires and cables and high voltage cables, and underfloor raceway systems made and sold in the past by National Electric Products Corporation.

The new Porter division is headed by **Robert F. Bennett, Jr.** as General Manager. In this capacity he will report directly to E. H. Mann, Vice President of H. K. Porter Company, Inc. Vincent P. Oatis, Jr., has been appointed Sales Manager.

National Insulation Manufacturers Assoc.

The National Insulation Manufacturers Association has been formed by members of the industrial insulation industry of the United States. Announcement was made by the President of the organization, **E. H. Luchs** of the Mundet Cork Corporation.

The Association has been formed as a voluntary and unincorporated organization designed to render service to manufacturers of insulation for industrial and commercial use and to promote the welfare and development of the industrial insulation industry.

Officers of the Association include Mr. Luchs, President; R. A. McLaughlin, Pittsburgh Plate Glass Co., Vice President; F. T. Christenson, Refractory and Insulation Corp., Treasurer, and J. M. Barnhart, Executive Secretary.

NOW— Portable, Plug-In High Pressure STEAM-JET CLEANING

Steam at the flick of a switch—on 115 or 230-volt circuits! Precision-built—instrument quality. Accessories include steam hose, high pressure nozzle and rubber-tired cart—all easily attached.

THE SPEEDYLECTRIC SERIES "R" STEAM GENERATOR

★ Pressures up to 250 psi to 407° F.

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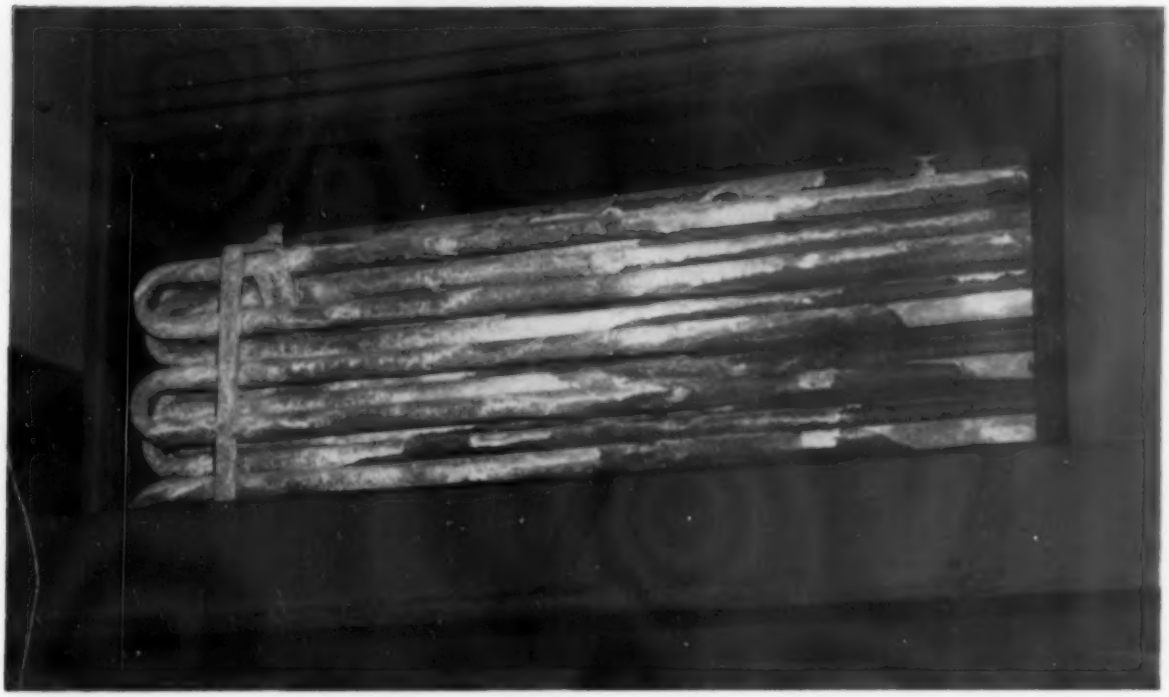

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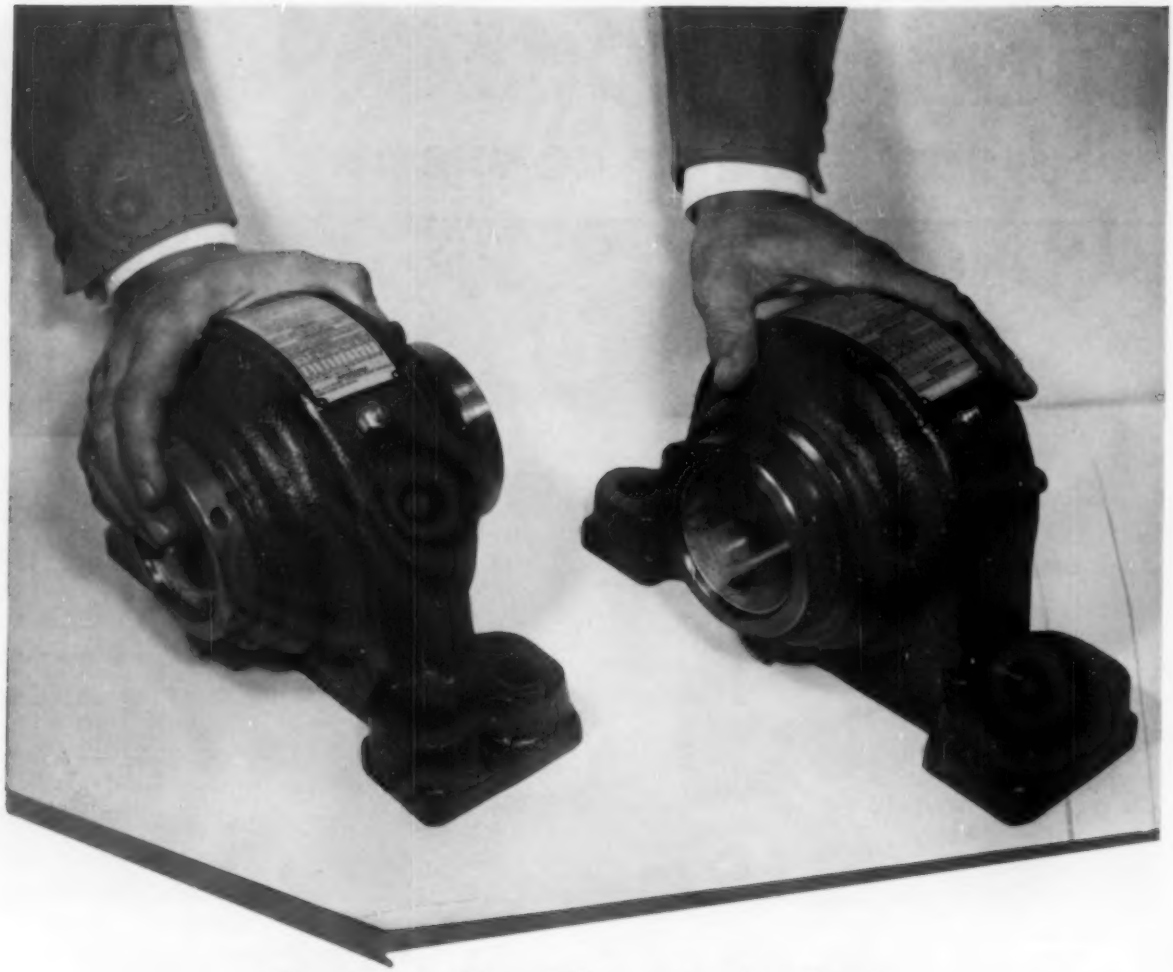

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